Technical Report on the Turmalina Mining Complex, Minas Gerais, Brazil

Report for NI 43-101

Jaguar Mining Inc.

SLR Project No.: 233.03852.00001

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1.0 Summary

1.1 Executive Summary

SLR Consulting (Canada) Ltd (SLR) was retained by Jaguar Mining Inc. (Jaguar) to prepare an independent Technical Report on the Turmalina Mining Complex (the MTL Complex), located in the state of Minas Gerais, Brazil. The purpose of this Technical Report is to update the Mineral Resources and Mineral Reserves for the MTL Complex. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. SLR visited the property in December 2022.

The MTL Complex is operated by Jaguar's wholly-owned subsidiary, Mineração Serras do Oeste (MSOL). The MTL Complex consists of Turmalina, including the Turmalina Mine, a processing plant (the Turmalina Plant), three satellite deposits (Faina, Pontal, and Zona Basal), and the Pitangui Project. The Turmalina Mine consists of several mineralized zones that are grouped into three orebodies – Orebodies A, B, and C. Two of the satellite deposits, Faina and Pontal, are located along strike to the northwest. The Zona Basal satellite deposit is located in the structural footwall of the current Turmalina mine workings, approximately three kilometers to the west. The Pitangui Project is located east of the Turmalina Mine and contains the São Sebastião gold deposit, which is approximately 20 km to the east of the Turmalina Plant.

Jaguar is a Canadian listed junior gold mining, development, and exploration company operating in Brazil with three gold mining complexes and a large land package covering in total approximately 63,313 ha (Jaguar Mining 30,026 ha, Iamgold JV 36,286 ha). Jaguar's principal operating assets are located in the Iron Quadrangle, which is a greenstone belt in the state of Minas Gerais. Jaguar's common shares are listed on the Toronto Stock Exchange under the symbol JAG.

Jaguar acquired the Turmalina Mine from AngloGold Ashanti Ltd. (AngloGold) in September 2004 and commenced mining operations in late 2006. The Turmalina Mine uses sublevel open stoping (SLOS) with backfill at a production rate of 1,100 tonnes per day (tpd) and ore is processed at the adjacent 2,000 tpd carbon-in-pulp (CIP) processing plant. At the Turmalina Plant, there are two lines of production that have the ability to run independently or combined in their CIP circuits. The first line consists of two ball mills (Mills #1 and #2), and the second line consists of a third ball mill (Mill #3).

Jaguar completed the acquisition of the Pitangui Project in September 2023 from IAMGOLD Corporation (IAMGOLD). Sources of Information

1.1.1 Conclusions

1.1.1.1 Geology and Mineral Resources

- The land holdings comprising the MTL Complex were increased in 2023 with the acquisition of the Pitangui claim block. This claim block contains the São Sebastiao deposit.
- The Mineral Resources for the MTL Complex comprise five distinct deposits, namely the Turmalina Mine, Faina, Pontal and Pontal South (collectively, the Pontal Deposits), Zona Basal, and São Sebastiao deposits.
- Mining operations are currently focused mainly on extraction of mineralized material from Orebody C of the Turmalina Mine, with secondary production being achieved from

Orebodies A and B. Underground access is currently being established to the Faina deposit.

- The current Mineral Resource estimate includes an initial estimate of the Pontal South deposit Resources, which is a mineralized zone discovered in 2023 along the southeastern strike projection of the previously known mineralization of the Pontal deposit. This is the first-time disclosure of technical supporting information for the collective Pontal deposits.
- The current Mineral Resource estimate includes the initial disclosure of technical supporting information for the Zona Basal deposit Resources.
- The current Mineral Resource estimate also includes Jaguar's first-time disclosure of the Mineral Resources estimated for the São Sebastião deposit.
- The total combined Mineral Resources for the five deposits comprising the MTL Complex are estimated to total approximately 8.50 million tonnes (Mt) at an average grade of 4.23 g/t Au in the Measured and Indicated Mineral Resource categories (approximately 1.16 million ounces (Moz) Au). An additional amount of approximately 7.64 Mt at an average grade of 3.58 g/t Au (approximately 0.88 Moz Au) is estimated in the Inferred Mineral Resource category.

1.1.1.2 Mining and Mineral Reserves

- The MTL Complex Mineral Reserve estimates were prepared in accordance with CIM (2014) definitions.
- Proven and Probable Mineral Reserves total 2.47 Mt at an average grade of 4.08 g/t Au, containing 324,000 oz Au. The Mineral Reserve estimate includes an initial estimate of 0.79 Mt at a grade of 5.22 g/t Au, containing 132,000 oz Au, at Faina.
- The Turmalina deposit is suitable for SLOS, considering the orebody's configuration and geotechnical characteristics.
- Orebody C has replaced Orebody A as the Turmalina Mine's principal production source. Orebody A has paused mining at depth until market conditions are more favourable.
- The Turmalina Mine's ventilation system is pull type with fresh air drawn down the ramp and an intake raise, and return air exhausted via three ventilation raises.
- The Turmalina Mine operations area has a workforce of approximately 700 personnel, with Jaguar personnel accounting for approximately 62% of the workforce and the remainder being contractor employees.

1.1.1.3 Mineral Processing and Metallurgical Testing

Turmalina

- During 2021, the Turmalina Plant processed approximately 409,700 t at an average grade of 3.12 g/t Au and the overall plant recovery was 88.6%. The current mine plan includes ore from the Turmalina mine and the Faina deposit. The peak production rate in the LOM plan is 2025 and 2026 producing approximately 600,000 tonnes per year (tpa) or 1,644 tonnes per day (tpd). The Turmalina Plant has a nominal processing capacity of 2,000 tpd ore (720,000 tpa) providing approximately 18% excess capacity at the planned peak production rate.

- The Turmalina leaching circuit consists of seven agitated tanks operating in series. Lime and NaCN are added to the first tank to adjust the pH and commence the leaching process. If required for processing Faina and Pitangui ores, the first tank(s) can be used for sulphide preoxidation, adding oxygen or air and lime. NaCN would then be added in the second tank to begin the leaching process.
- The Turmalina Plant achieves consistent recoveries between 87% and 92% processing Turmalina ore.

Faina

- TESTWORK Desenvolvimento de Processo Ltda. (TDP) conducted a series of diagnostic tests on two composite samples to determine the amenability of gold extraction from Faina material using different processes. The highest gold recovery achieved was from a combination of gravity concentration followed by flotation of gravity tails on sample SF1 (92.36% overall gold recovery).
- The current intent for processing Faina ore at Turmalina is direct carbon in leach (CIL) with leach additives, which is expected to yield overall recoveries of approximately 55%.
- The results of the SF1 tests indicate that Au recovery is higher for the direct leach tests than the CIL tests and that the Au recovery is proportional to particle size distribution. The highest gold recovery in direct leaching (53.51%) was obtained at a particle size of 80% passing (P_{80}) = 53 µm (test LT6). The highest gold recovery in CIL tests (48.97%) was obtained at a particle size of P_{80} = 53 µm (test LT11).
- Direct carbon in leach (CIL) testing was performed on two composite samples without gravity concentration. The tests conditions included a 6 hr preleach with lime and a 48 hr CIL leach retention time. The leach recoveries for LT1 and LT2 averaged 48.0% and the leach recoveries for LT5 and LT6 averaged 49.27%
- Direct CIL tests were performed on composite samples and in one case flotation tailings using the standard 6 hour preleach followed by 48 hours of CIL and with a variety of leach additives including O2, air, Pb(NO3)2, H2O2 and the polymer ZT POLY MINE.
  - The highest 18-hour leach recovery was 66.06% using air and 400 g/t ZT Polymine though the recovery dropped to 44.4% after 24 hours of leaching indicating reprecipitation.
  - In all cases, using hydrogen peroxide and ZT Polymine had higher recoveries after 18 hours than after 24 hours indicating reprecipitation of dissolved gold over time, possibly due to low NaCN solution concentrations from oxidation of NaCN by hydrogen peroxide and ZT Polymine.
  - CIL leaching with oxygen rather than air and no additives resulted in a Au recovery of 43.06% and the same conditions but Pb(NO3)2 increased the Au recovery to 46.7%.
  - Additional testing should be performed to determine the reason for reprecipitation.

Pitangui

- Metallurgical testing programs on Pitangui samples were completed by SGS Minerals Services (SGS), Lakefield, Ontario in 2014 and ALS Metallurgy (ALS), Kamloops, British Columbia in 2016.
- Mineralogy studies reported that the main sulphide minerals in the ore were pyrrhotite (12 to 31%) with variable levels of arsenopyrite (0.6 to 3.0%) and a limited amount of pyrite

(up to 1.5%). Pyrrhotite is a highly reactive sulphide mineral and a major NaCN and oxygen consumer contributing to high cyanide and lime consumption.

- SGS conducted 48 hour whole ore leach (WOL) testing on both composites. Pre-aeration was done using air or pure oxygen from 2 to 18 hours before leaching. Calculated gold extractions ranged from 89% to 96% for the two samples. Lime consumption was relatively constant at 1.0 kg/t to 1.6 kg/t.
- The study assumes that the plant will operate a WOL circuit with adequate pre-aeration to sustain dissolved oxygen levels and will provide at least a 24-hour leach residence time. Primary grind size should be 80% passing 53 µm or finer with the provision to add lead nitrate as required.

1.1.1.4 Infrastructure

- The MTL Complex infrastructure is sufficient for the 2,000 tpd mining and milling operations at Turmalina, Faina, and Pontal operations. There is no infrastructure related to the Faina and Pontal historic open pit operations.
- Electrical power is obtained from the national grid.
- Water and sewer access for the Turmalina Mine and Turmalina Plant are via the local system.
- All tailings are either dry stacked on surface or used as cemented paste fill underground. A tailings storage facility, which includes a dam, was in use until September 2021, and is now in the process of closure.

1.1.1.5 Environment

- Jaguar has an Environmental and Social Governance Framework and several supporting policies. The company is also committed to complying with international best practice.
- Jaguar acquired the Pitangui property in September 2023, therefore no environmental studies, social engagement or permit planning has been conducted at this stage.
- No environmental issues were identified from the documentation available for the SLR QP's review of the existing operations. The Complex complies with applicable Brazilian permitting requirements. The approved permits and the license renewals address the Brazilian authority's requirements for mining extraction and operation activities.
- Environmental monitoring is carried out by Jaguar at the Turmalina Complex according to the obligations defined in the environmental permits. These include surface water quality, groundwater quality, air quality, and ambient noise.
- Jaguar maintains relationships with nearby communities and stakeholders. Jaguar's commitment to community development and programs is demonstrated through its ongoing investments in the "Seeds of Sustainability" program and other social investment projects.
- Information on any existing or potential heritage or archeological resources was not provided at the time of this review, and the mine does not have a Chance Find procedure.

1.1.2 Recommendations

1.1.2.1 Geology and Mineral Resources

Exploration

1 Continue planned exploration, targeting shallow extensions to mineralization along the Orebody B trend as well as drilling the down-plunge and along-strike projections of Orebody C.

2 Consider initiating an exploration program that targets the presence of additional parallel structures located in proximity to Orebodies A, B, and C using a small number of horizontal drill holes drilled into the hangingwall and footwall of the known orebodies.

3 Evaluate the strike and depth potential of Orebody D.

4 Evaluate the depth potential of Zona Basal.

5 Target extensions along strike and down dip from higher grade mineralized intercepts at Pontal. Additionally, the drilling efforts should aim to confirm the orientations of mineralization northeast of the primary lithological contacts.

6 Conduct a regional exploration program on the Turmalina land holdings to search for additional mineralized zones.

7 Evaluate the exploration potential of the newly acquired Pitangui claim block.

Quality Assurance/Quality Control

1 Modify the QA/QC program to include duplicate assaying using sample pulps.

Mineral Resource Estimates

2 Include a field for the sample identification number for all assay data exports from the primary database to the individual software packages being used to complete the Mineral Resource estimates.

3 Correct erroneous or anomalous information for drill holes that are located in the un-mined portions of the Turmalina deposit.

4 Remove drill hole or channel samples considered to be of unreliable quality from the active database, and place these into a database that is dedicated specifically for records considered to be of unreliable quality.

5 Modify the wireframe construction strategy to use a cut-off grade that more closely reflects the Mineral Resource cut-off grade for each orebody. It is anticipated that this will increase the average grades of the mineralized wireframes by reducing the amount of internal dilution that is currently being included.

6 Analyze possible revised capping values for Orebody C in the 30 g/t Au to 45 g/t Au range to determine whether application of a revised capping value will improve grade reconciliation with production data.

7 Prepare and code a lithological model for the Turmalina Mine into the block model to be used to improve the allocation of the density measurements for future Mineral Resource updates. Collect additional density measurements from samples contained within the mineralized wireframes of Orebody B.

8 Continue geological mapping, along with structural and alteration studies, to understand the nature of the gold mineralization and the structural and stratigraphic controls on the distribution of the gold values for Orebody C. The results of these studies will be of great use in understanding the controls on the distribution of the higher grade pods and will aid in developing exploration targets in this area of the mine property.

9 Consider the use of a dynamic anisotropy method for estimation of gold grades into the Turmalina mine block model.

10 Review the anisotropy ratios on an individual wireframe basis for the Turmalina mine rather than on an orebody basis.

11 Carry out a short study to determine the optimum selection of search strategy input parameters to reduce the number of estimation artifacts for the mineralized lenses in the Turmalina mine.

12 Collect additional drill hole information in the areas containing estimation artifacts to improve the confidence level of the Mineral Resource estimate, reduce and remove the estimation artifacts, and search for the down-dip projections of the mineralization.

13 When no CMS model is available for a given excavation volume, use the design shape for the excavations in question as a proxy when preparing the reconciliation reports.

14 Adjust the Deswik parameters to better align to the local strike and dip variations of the resource wireframe reporting panels. This would allow the inclusion of additional material to the Mineral Resource.

15 Consider rehabilitation and dewatering of Pontal underground workings to improve the integration of underground sampling at Pontal with existing wireframe interpretation.

16 Review the Faina capping values periodically to reflect knowledge gained from production experience.

17 Revise the Pitangui mineralization wireframes to eliminate the use of 'pinch outs' and reduce the number of isolated wireframes with a single mineralized intercept. Additional efforts should be made to integrate the reference surfaces that control the lithological model wireframes with the mineralization wireframes to avoid clipping artifacts.

1.1.2.2 Mining and Mineral Reserves

1 Consider modelling mining costs by orebody, such that variable and incremental cut-off grades can be determined by orebody and the Mineral Reserve estimate, LOM plan, and processing capacity can be optimized.

2 Undertake a detailed incremental cost analysis, by orebody, to ensure that uneconomic material is not sent to the Turmalina Plant. Currently, the cost data available from the Turmalina Mine is not easily categorized. Unit mining costs vary between Orebody A, Orebody C, and Faina, given significant differences between mining width, production rates, ground conditions, and haul distances. The Turmalina Plant has excess production capacity, not otherwise put to use.

3 Continue to map and do geotechnical testing and logging in the Faina orebody.

4 Undertake a detailed ventilation assessment of the mine. Orebody A is being mined out and the ventilation demand is shifting.

5 Undertake a detailed power and water/pumping study of the mine to determine if saving can be done now that Orebody A is being mined out. Substations can be redistributed in the mine and pumps relocated.

1.1.2.3 Mineral Processing and Metallurgical Testing

1 Perform whole ore leach and/or CIL leach tests followed by flotation of leach tailings on Faina variability samples to optimize the process for all of the Faina deposit material types.

2 Identify potential smelters and pressure oxidation facilities that would be willing to purchase the Faina flotation concentrates.

3 Perform additional WOL leach tests on Faina material using air and ZT Polymine to determine the reason for the decrease in Au recovery after 18 hours of leaching. Reprecipitation due to NaCN consumption/depletion or other reasons.

4 Perform variability tests on the various Pitangui material types to optimize the preoxidation and cyanide leaching process. The objective is to maintain oxygen and NaCN solution concentrations for gold leaching in the presence of high pyrhotite concentrations.

5 Perform variability ore hardness testing on samples of both Faina and Pitangui materials as they require fine grinding (P_{80} 53µm) for optimal gold recovery.

1.1.2.4 Infrastructure

1 Evaluate opportunities to optimize the water pumping, power, and ventilation systems at the Turmalina Mine.

1.1.2.5 Environment

1 Jaguar acquired the Pitangui property in September 2023, therefore the required environmental studies will need to be conducted, a plan developed for conducting an environmental and social impact assessment, social engagement, for obtaining the required environmental authorizations and permits and surface rights well in advance of planned operations.

2 Continue to review management and mitigation corrective actions, as applicable, based on the data collected from the environmental monitoring programs.

3 Continue to monitor the long-term displacement and phreatic levels within filtered tailings stacks to observe trends and confirm physical stability, and continue to address recommendations made in the external tailings dam inspection and safety audit reports.

4 Continue to monitor seepage from all tailings disposal areas to confirm chemical stability.

5 Continue social engagement activities and the social projects in accordance with community feedback.

6 Develop and implement heritage and archaeological resources Chance Finds Procedure in accordance with international best practice.

1.1.2.6 Capital and Operating Costs

1 Consider modelling mining costs by orebody, such that variable and incremental cut-off grades can be determined by orebody and the Mineral Reserve estimate, LOM plan, and processing capacity can be optimized.

2 Undertake a detailed incremental cost analysis, by orebody, to ensure that uneconomic material is not sent to the Turmalina Plant. Currently, the cost data available from the Turmalina Mine is not easily categorized. Unit mining costs vary between Orebody A, Orebody C, and Faina, given significant differences between mining width, production rates, ground conditions, and haul distances. The Turmalina Plant has excess production capacity, not otherwise put to use.

1.2 Economic Analysis

The MTL complex is an operating producer of gold. The mine is profitable with a pre-tax free cash flow of US$ 115.8 million dollars and after-tax free cash flow of US$101.9 million dollars based on a six year mine life.

1.2.1 Economic Criteria

1.2.1.1 Revenue

The following factors were used in the Turmalina complex cashflow:

- 1,700 tonnes per day mining from underground (600,000 tonnes per year).
- Mill recovery for the Turmalina orebodies is 87%, the mill recovery for Faina is 55%
- Gold at refinery 99.95% payable.
- Exchange rate US$1.00 = BRL5.20.
- Metal price: US$1,650 per ounce gold.
- Net Smelter Return includes doré refining, transport, and insurance costs.
- Revenue is recognized at the time of production.

The Faina orebody has a lower recovery due to gold being contained in sulphides. Currently, Jaguar is milling Faina ore within the existing mill with little modifications to the mill. This will result in a recovery of 55%.

1.2.1.2 Costs

- Mine life: 6 years.
- Life of Mine production plan as summarized in Table 16.3.
- Mine life capital totals $47.2 million, including 15% contingency on non-sustaining capital.
- Average operating cost over the mine life is $78.77 per tonne milled.

1.2.1.3 Taxation and Royalties

Jaguar pays out both surface and mineral rights to various people and organizations. Table 22-1 lists the royalties.

Table 1-2: Royalties

Holder	Royalty	Orebody	Payment Status in R$[1]	
			Status	Paid in 2023 US$
Eduardo C. de Fonseca	5% of the Production Gross Profits until reaching US$10 million during current fiscal year, then 3% of the Production Gross Profit	A, B and C	Inactive	-
Carlos Andraus / Mirra Empreend. E Participações Ltda.			Active (30%)	2,372,479.86
Vera A. Di Pace / Vermar Empreend. E Participações Ltda.			Active (30%)	2,372,479.86
Paulo C. De Fonseca / Sandalo Empreend. E Participações Ltda.			Active (16%)	1,265,322.59
Clara Darghan/Mocla Empreend. E Participações Ltda.			Active (12%)	948,991.95
Eduardo Camiz de F. Junior / Agro Pecuária Aldebaram Empreend. Ltda.			Active (12%)	948,991.95
Surface Rights Royalties				
Holder	**Refers to**	**Orebody**	**Payment Status in R$[1]**	
			Base Value (a month)	**Paid in 2023**
José Laeste de Lacerda	Surface	A, B and C	14,812.00	14,812.00
Wilson Clemente de Faria	Building rent		13,570.00	139,443.65
	Surface		2,788.00	
EPAMIG	Surface	Faina	35,000.00	444,751.00
Moreiras Empreendimentos	Surface	Faina	-	30,011.36
Familia Freitas	Water pipe	A, B and C	13,200.00	161,644.75
	Water well		1,980.00	
	Road access		2,904.00	

The taxes paid are equivalent to US$5.68/t.

1.2.2 Cash Flow Analysis

The undiscounted after-tax cash flow for the Project totals $101.9 million over the mine life. The after-tax Net Present Value (NPV) at a 7.5% discount rate is $77.6 million, as shown in Table 22-2.

Table 1-3: After-Tax Cash Flow Summary

Description	Value
Realized Market Prices	
Au ($/oz)	1,650
Payable Metal	
Au (koz)	240
	US$ million
Total Gross Revenue	**395.5**
Mining Cost	104
Process Cost (Turmalina)	49.6
Process Cost (Faina)	29.2
G&A Cost	17.5
Total Operating Costs	**200.8**
Operating Margin (EBITDA)	**194.8**
Cash Taxes Payable	13.9
Operating Cash Flow	
Development Capital	35.3
Sustaining Capital	5.2
Total Closure/Reclamation Capital	6.7
Total Capital	**47.3**
Pre-tax Free Cash Flow	**115.8**
Pre-tax NPV @ 7.5%	**88.1**
After-tax Free Cash Flow	**101.9**
After-tax NPV @ 7.5%	**77.6**

The World Gold Council Adjusted Operating Cost (AOC) is US$837.07 per ounce of gold. The mine life capital cost, including both pre-production and sustaining unit cost, is US$197.12 per ounce, for an All in Sustaining Cost (AISC) of US$1,034.20 per ounce of gold. Once the Project enters commercial production, the AISC is US$1,034.20 per ounce of gold. Average annual gold production during operation is 40,000 ounces per year.

The after-tax Net Present Value (NPV) at a 10% discount rate is $80.98 million.

A detailed cash flow is presented in Appendix 1.

1.2.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Gold price $1,650 US$/oz
- Exchange rate 5.2 BRL to 1 US$
- Head grade 4.08 g/t
- Operating costs $78.77/t
- Mine life is 6 years.

The cash flow is most sensitive to gold price, head grade, and recovery.

1.3 Technical Summary

1.3.1 Property Description and Location

The MTL Complex has been expanded to include the Pitangui Project that was acquired as part of the purchase transaction completed with IAMGOLD in September 2023. The MTL Complex comprises five known mineral deposits and is located approximately 120 km northwest of the Minas Gerais state capital of Belo Horizonte and approximately 10 km south of Pitangui, the nearest town of significant size. Located on the newly acquired Pitangui claim group, the São Sebastião deposit is located approximately 20 km to the east of Turmalina.

The MTL Complex comprises a number of contiguous mineral rights holdings granted by the ANM that, as of October 2023, cover an area of approximately 2,932 ha of mining permits ("mining concessions"), 963 ha of mining permit requests, and 4,314 ha of active exploration permits ("exploration authorizations"). The Pitangui Project comprises nine mineral rights holdings granted by the ANM, covering an area of 12,534.16 ha with active exploration permits ('exploration authorizations') as of October 2023.

Jaguar acquired Turmalina from AngloGold in September 2004. Jaguar, through its wholly-owned subsidiary, MSOL, holds 100% ownership of Turmalina, subject to a 5% net revenue interest up to $10 million, and 3% thereafter, to an independent third party. In addition, there is a 0.5% net revenue interest payable to the surface landowner. As part of the purchase agreement for 100% of the Pitangui Project from IAMGOLD, Jaguar has agreed to pay IAMGOLD a royalty of US$80/oz for the initial 250,000 oz of gold sold from the Pitangui Project, after which, the quarterly royalty payable to IAMGOLD will be 1.5% NSR.

1.3.2 Geology and Mineralization

The MTL Complex is underlain by Archaean and Neoproterozoic age rocks. Archaean units include a granitic basement, overlain by the Pitangui Group, a sequence of ultramafic to intermediate volcanic flows and pyroclastics and associated sediments. The Turmalina deposit is hosted by chlorite-amphibole schist and biotite schist units within the Pitangui Group. A sequence of sheared, banded, sulphide iron formation and chert lie within the stratigraphic sequence. The stratigraphy locally strikes to azimuth 135°. The Turmalina deposits are believed to be typical examples of mesothermal, epigenetic deposits that are enclosed by host rocks that have undergone amphibolite grade metamorphism.

1.3.2.1 Turmalina Mine

The mineralization at the Turmalina deposit consists of a number of stratabound, tabular bodies that are spatially related to either a BIF package or to a package of slightly silicified quartz-muscovite-biotite schists. These tabular bodies are grouped together, according to the host stratigraphy, to the spatial configuration and to the gold content, into Orebodies A, B, and C (together the Orebodies). Gold can occur within the BIF package, but can equally occur in the other host lithologies. Gold mineralization in the Turmalina deposits occurs in fine grains associated with sulphides in sheared schists and BIF sequences. Gold particles are mostly associated with arsenopyrite, quartz, and micas (sericite and biotite). Coarse grained gold, on a millimetre scale, is found locally with discrete quartz veins, but this type of occurrence is minor at the Turmalina deposit.

1.3.2.2 Faina Deposit

The Faina mineralization and mineralized zones hosted by the Mafic Metavolcanic Unit is inferred to be related, in a larger scale, to a regional, northwest-southeast oriented, transpressional faulting event that also generated a coeval smaller-scale system of east-northeast–west-southwest accommodation, transcurrent-movement faults.

The auriferous gold mineralization at the Faina deposit corresponds mainly to swarms of sulphide bearing quartz veinlets (individual veinlets with millimetric to centimetric widths) which are hosted by amphibolitic packages of the Mafic Volcanic Unit. The mineralized swarms of quartz veinlets appear to occur within conformable horizons to the mine stratigraphic package, in at least several distinct “stratigraphic layers” of the Mafic Volcanic Unit.

1.3.2.3 Pontal Deposits

The current interpretation is that the Pontal gold mineralization event is related to a northwest-southeast semi-regional shear-fault zone and also to more local northeast-southwest or east-northeast–west-southwest fault zones of sinistral transcurrent nature.

Three slightly different styles of gold mineralization have been recorded in the Pontal South target, despite the fact that all of them are gold-arsenic-antimony rich. The most common style consists of fine grained disseminations of sulphides composed mostly of arsenopyrite, pyrite, and pyrrhotite contained within the pyroclastic host rocks. The second style corresponds to massive concentrations of sulphides (mainly arsenopyrite and antimony sulphides) located around quartz veins and within highly (or pervasively) silicified domains of the same pyroclastic host rocks. The last style to be considered would be a result of the presence of multiple sulphidized clasts and coarse transported fragments, either primarily mineralized and redeposited, or eventually replaced by the same ore fluids that “sulphidized” the matrix of the pyroclastic host rocks.

1.3.2.4 Zona Basal Deposit

The Zona Basal hypogenic economic mineralization can be understood as a system that is primarily controlled by a major northwest-southeast oriented transpressive structural movement zone and which is spatially located approximately at the axial-plane setting of the Zona Basal overturned antiform. The Zona Basal “supergene” (or surficial) mineralization appears to concentrate economic gold grades as well as some silver and other base metals in the weathering halo. The more ubiquitous mineralization style recorded at Zona Basal corresponds to fine grained disseminations of sulphides (arsenopyrite, pyrite, and pyrrhotite) hosted by the favorably-replaced volcano-chemical horizons.

1.3.2.5 São Sebastiao Deposit

Gold mineralization at the São Sebastião deposit is contained within deposits hosted in three main strata-confined sulfidations zones within several stacked banded iron formation layers in the lower unit of the Pitangui greenstone belt. The main mineralized zones in the São Sebastião gold deposit are hosted in the two most continuous banded iron formation packages of the lower unit.

The sulphide mineralization in these zones most commonly occurs as disseminations replacing magnetite, however occasional massive sulphide mineralization in quartz-carbonate veins and breccias can occur. Pyrrhotite is the dominant sulphide, followed by arsenopyrite, pyrite, and chalcopyrite, which appear in smaller concentrations.

1.3.3 Exploration Status

Exploration activities at the Faina deposit in 2023 consisted of geological mapping of exposures along the underground galleries and ore drives as development progresses towards the Faina deposit. The mapping completed to date indicates that the gold mineralization is hosted in both chemical meta-sediments (banded iron formations and meta-cherts) in the footwall and in meta-basalts in the hanging wall. The host rocks are folded with northeast plunging fold noses and are displaced by a number of east-west striking, semi-vertical faults. The electrical properties of 462 drill core samples were also measured.

1.3.4 Mineral Resources

The current Mineral Resource estimates for the Turmalina Complex comprise updates of the previous Mineral Resource estimates for the Turmalina Mine, the Faina Deposit, the former LB1 and LB2 zones at the Pontal deposit. The current Pontal Mineral Resource estimate includes a first-time estimate of the newly discovered mineralized zone located in 2023 along the southeastern strike projection of the previously known mineralization. This newly discovered zone is referred to as the Pontal South deposit.

The current Mineral Resource estimate includes the first-time disclosure of the estimation methods used to prepare the Mineral Resource estimate for the newly discovered mineralization at the Zona Basal deposit. This deposit is located approximately three kilometres to the west of the Turmalina Mine and was discovered by Jaguar's exploration team as a result of trenching and drilling programs carried out in 2020 and 2021.

The current Mineral Resource estimate also includes the São Sebastião deposit, located approximately 20 km to the east of the Turmalina Mine. This deposit was recently acquired by Jaguar in September 2023.

SLR has audited and accepted the Turmalina, Faina, Pontal, and Zona Basal Mineral Resource estimates prepared by Jaguar. SLR has also audited and accepted the block model prepared by SRK Consulting for the São Sebastião deposit. SLR prepared updated Mineral Resource statements for the São Sebastião deposit using updated gold prices and newly created reporting panels in order to meet the "Reasonable Prospects for Eventual Economic Extraction" requirement of the CIM Definition Standards for Mineral Resources.

Table 1-1 summarizes the Mineral Resources as of November 30, 2023, based on a US$1,800/oz Au price for the Turmalina Mine, Faina, Pontal, Zona Basal, and the São Sebastião deposits. Mineral Resource estimates were prepared for the Turmalina Mine and the Faina, Pontal, and São Sebastião deposits based upon the conceptual view that the mineralized material would be extracted using underground mining methods. The Mineral Resource estimate for the Zona Basal deposit was prepared using a conceptual view that the mineralized material would be extracted principally by means of open pit mining methods.

The technical disclosure related to the five deposits described herein—the Turmalina Mine, Faina, Pontal, and Pontal South (collectively the Pontal Deposits), Zona Basal, and São Sebastiao deposits have a variety of dates supporting the disclosure of Mineral Resources and Reserves (MRMR). A summary of these dates is provided below on a deposit by deposit basis.

- Technical Report:
  - Effective Date: November 30, 2023
- Turmalina:
  - MRMR Drill Hole Database Date: September 13, 2022
  - Depletion Date: July 31, 2023
  - Mineral Resources and Mineral Reserves Reporting Date: July 31, 2023
  - Reconciliation Data Date: September 30, 2023
- Faina:
  - MRMR Drill Hole Database Date: September 9, 2022
  - Mineral Resources Reporting Date: March 30, 2023
  - Mineral Reserves Reporting Date: July 31, 2023
- Pontal:
  - MRMR Drill Hole Database Date: September 9, 2022
  - Mineral Resources Reporting Date: November 30, 2023
- Zona Basal:
  - MRMR Drill Hole Database Date: August 25, 2022
  - Mineral Resources Reporting Date: December 31, 2022
- Pitangui:
  - MRMR Drill Hole Database Date: July 29, 2019
  - Property Acquisition Date: September 13, 2023
  - Mineral Resources Reporting Date: November 30, 2023

The “Reasonable Prospects for Eventual Economic Extraction” requirement of the CIM Definition Standards for Mineral Resources were met for the Turmalina Mine and the Faina, Pontal, Zona Basal, and São Sebastião deposits by means of either applying reporting panels, clipping polygons, or open pit resource shells as constraints when preparing the Mineral Resource statements. Statements of the individual Mineral Resource estimates for the five deposits are presented below.

Table 1-1: Summary of Mineral Resources for the MTL Complex as at November 30, 2023

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Measured	1,691	4.73	257
Indicated	6,804	4.10	898
Total Measured and Indicated	***8,495***	***4.23***	***1,155***
Inferred	7,644	3.58	881

Notes:

1. CIM (2014) definitions were followed for the classification of Mineral Resources.
1. Mineral Resources are inclusive of the Mineral Reserves at Turmalina. No Mineral Reserves are currently present at the Pontal, Zona Basal, or São Sebastião deposits.
2. Mineral Resources are estimated at a cut-off grade of 1.79 g/t Au at Turmalina, 2.81 g/t Au at Faina, 3.0 g/t Au at Pontal, 0.75 g/t Au at Zona Basal and 2.25 g/t Au at São Sebastião.
3. Mineral Resources at the Turmalina deposit include all drill hole and channel sample data as of September 13, 2022, and are depleted using mining excavations as of July 31, 2023. Mineral Resources at the Faina and Pontal deposits include drill hole information as of September 9, 2022. Mineral Resources at the Zona Basal deposit include drill hole information current as of August 25, 2022. Mineral Resources at the São Sebastião deposit include drill hole information current as of July 29, 2019.
4. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au for the Turmalina, Faina, Pontal, Zona Basal, and São Sebastião deposits.
5. Mineral Resources are estimated using an average long term exchange rate of R$5.20 : US$1.00 for the Turmalina Faina, Pontal, and Zona Basal deposits.
6. Minimum widths of approximately 2.0 metres were used for Turmalina, Faina, Pontal, and Zona Basal. A minimum height of 2 m was applied to São Sebastião using reporting panels.
7. Gold grades are estimated by the OK interpolation algorithm using capped composite samples.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

1.3.5 Mineral Reserves

The current mining reserves include update to orebodies A, B, and C, as well as introducing Faina, a new orebody into Reserves. This is a first-time disclosure of Faina into Reserves.

Table 1-2 summarizes the Mineral Reserves as of July 31, 2023, based on a US$1,650/oz Au price for the Turmalina Mine, Faina. Mineral Reserve estimates were prepared for the Turmalina Mine and the Faina, based on a mine design and schedule prepared by Deswik Brazil.

Table 1-2: Summary of Mineral Reserves – July 31, 2023

	Proven			Probable			Proven and Probable Reserves		
Deposit	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Orebody A	299	4.62	44	78	3.38	9	377	4.37	53
Orebody B	271	3.26	23	104	3.50	12	321	3.34	34
Orebody C	309	3.32	33	679	3.30	72	988	3.30	105
Subtotal Turmalina	**824**	**3.78**	**100**	**862**	**3.33**	**92**	**1,686**	**3.55**	**192**
Faina				787	5.22	132	787	5.22	132
Total Turmalina UG	**824**	**3.78**	**100**	**1,648**	**4.23**	**224**	**2,472**	**4.08**	**324**

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 2.39 g/t Au for orebodies A, B, and C. For Faina, the Mineral Reserves are estimated at a cut-off grade of 4.00 g/t
3. Mineral Reserves are estimated using an average long-term gold price of US$1,650 per ounce and a BRL/US$ exchange rate of 5.20.
4. A minimum mining width of 3.5 m was used at Orebodies A, B, and C and 2 m at Faina.
5. Bulk density is 2.85 t/m^3.
6. Numbers may not add due to rounding.

The QP is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

1.3.6 Mining Method

The Turmalina underground operations consist of several zones grouped into four orebodies – Orebodies A, B, C, and Faina. At present, the Turmalina Mine produces on average 1,350 tpd from Orebodies A, B, C, and Faina. Underground operations at depth in Orebody A have been temporarily paused due to unfavorable economic conditions.

The mining method used at the Turmalina Mine (including Faina) is SLOS with delayed backfill. Both longitudinal and transverse versions of the method are used, depending on the width of the deposit. Access to the stopes is provided by sublevel development driven off the ramp. The sublevel interval is 20 m. The Turmalina deposit is mined in horizons between sublevels. Each horizon is mined in retreating fashion, starting at the end of the mineralized zone and progressing to the central crosscuts. The stope length is typically 40 m along strike, and rib pillars or partial rib pillars separate adjacent stopes. Once mined out, stopes are backfilled with cemented rockfill, unconsolidated rockfill, or paste fill. The horizons are mined in a bottom-up sequence between sill pillars.

1.3.7 Mineral Processing

The Turmalina Plant has a nominal processing capacity of 2,000 tpd, or 720,000 tonnes per annum (tpa). Since inception, the Turmalina Plant has been achieving annual overall recoveries of between 87% and 92%. The process flowsheet includes three-stage crushing and screening to minus 9.5 mm (-3/8 in.), ball mill grinding, thickening, cyanide leaching, carbon in pulp (CIP), carbon elution, Au electrowinning, and smelting. The tailings are conveyed by gravity to a detoxification unit for arsenic removal and cyanide destruction and then are pumped to the paste fill plant to be used either for mine backfill or deposited on a dry stack storage area. Process tailings have also been dry stacked in completed open pits on the mine site.

At the Turmalina Plant, there are two parallel grinding and CIP lines that can run independently or combined in their CIP circuits. The first line consists of two ball mills (Mills #1 and #2), and the second line consists of a third ball mill (Mill #3). In January 2017, Mill #3 was recommissioned with an estimated installed capacity of 1,600 tpd. Using only Mill #3, Turmalina has been able to achieve the entire throughput of the Turmalina Plant with a lower operating cost, through electricity consumption savings, compared to using both Mills #1 and #2 in 2016. Mill #1 is used on an as need basis, while Mill #2 has been taken off-line for maintenance and will be kept on standby mode in the future. Total milling capacity is more than 3,000 tpd which allows for a potential future plant expansion.

1.3.8 Project Infrastructure

The Turmalina Complex includes the Turmalina Plant, with a nominal capacity of 2,000 tpd, and tailings disposal area.

Electrical power is obtained from the national grid.

Ancillary buildings located near the mine entrance include the gate house with a reception area and waiting room, administration building, maintenance shops, cafeteria, warehouse, change room, first aid room, and compressor room.

The explosives warehouse is located 1.2 km away from the Turmalina Mine area, in compliance with the regulations set forth by the Brazilian Army. There is no camp at the Turmalina Mine site.

Additional ancillary buildings are located near the Turmalina Plant and include an office building, a laboratory, warehousing, and a small maintenance shop.

There is no infrastructure related to the Faina and Pontal historic open pit operations.

1.3.9 Market Studies

Gold is the principal commodity at the MTL Complex and is freely traded at prices that are widely known, so that prospects for sale of any production are virtually assured. A gold price of $1,650/oz Au was used for estimation of Mineral Reserves and for the economic analysis

1.3.10 Environmental, Permitting and Social Considerations

The company is committed to comply with law, guidelines, including the International Finance Corporation's (IFC) Performance Standards Performance Standards on Environmental and Social Sustainability, United Nations Policy Framework for Business and Human Rights), AA1000 Stakeholder Engagement Standard 2015 (Accountability), Sustainable Development Goals (SDG), United Nations Development Program (UNDP), and Global Reporting Initiative (GRI) Guidelines.

The mine has an Environmental and Social Governance Framework and several supporting policies such as a Risk Management Policy (2022), Compliance Policy (2023), Code of Conduct and Ethics Policy (2023), Anti-bribery and Corruption Policy (2023), and a Whistleblower Policy (2023).

Environmental studies pertaining to ARD potential have been carried out as requested by the National Environmental and Sustainable Development Agency (SUPRAM for its acronym in Portuguese), on Operation Licence ('Licença de Operação', or LO) 012/2008. These studies continued from 2007 through 2017. In February 2018, a specialized report from Galapagos Consultoria Ltda was issued (Jaguar, 2022), which indicated low ARD potential of the mined material due to the low concentration of sulphides and the presence of compounds with neutralization potential, such as carbonates. However, the study also indicated arsenic leaching potential and, as a result, Jaguar initiated a contamination plume investigation. Jaguar has officially informed SUPRAM about the arsenic leaching potential.

In 2021, Jaguar developed the "Environmental Performance Assessment Report" as a way to confirm if all the Turmalina operation controls and required best practices were being completed and supervised in accordance with the legal standards. This comprehensive report will be delivered to SUPRAM in 2022, in support of the reassessment process for the LO.

Jaguar indicated in January 2024 that all the required permits and authorizations are in place, environmental monitoring continues in line with permit requirements, and that there have been no recent non-compliance issues.

Jaguar maintains relationships with the surrounding communities through regular engagement and social investment projects.

The operation does not have a Chance Finds procedure and there was no information on heritage and archeological resources at the time of writing this report.

Since Jaguar acquired the Pitangui property in September 2023, no environmental studies, social engagement, permit planning or closure planning have yet been completed on this property. In addition, Jaguar does not yet own the surface rights for this property which are understood to be privately owned. Jaguar will need to develop and implement plans to conduct the required studies, engagement and obtain the authorisations and permits well in advance of starting any activities on this property.

1.3.11 Capital and Operating Cost Estimates

Jaguar is investing new capital into the Faina deposit as well as continuing to invest in the main Turmalina orebodies. Sustaining capital, consisting of exploration and infill drilling, plus plant capital equipment items, totals $1.6 million in 2024, and $5.3 million over the LOM. The majority of the non-sustaining capital will be used to implement the Faina mining operations, including mine equipment, and adjustments to the plant and tailings storage configuration. This capital totals $7.4 million in 2024, and $34.0 million over the LOM.

LOM unit operating costs are summarized in Table 1-3.

Table 1-3: Unit Operating Costs

Cost Area	Turmalina (US$/t milled)	Faina (US$/t milled)
Mining	42.26	42.26
Processing	29.44	37.09
G&A	7.07	7.07
Total	**78.77**	**86.42**

Source: Jaguar, 2023

2.0 Introduction

SLR Consulting (Canada) Ltd. (SLR) was retained by Jaguar Mining Inc. (Jaguar) to prepare an independent Technical Report on the Turmalina Mining Complex (the MTL Complex), located in the state of Minas Gerais, Brazil. The purpose of this Technical Report is to support the disclosure of the Mineral Reserves and Mineral Resources as of November 30, 2023. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

Jaguar is a Canadian listed junior gold mining, development, and exploration company operating in Brazil with three gold mining complexes and a large land package covering in total approximately 63,313 ha (Jaguar Mining 30,026 ha, Iamgold JV 36,286 ha). Jaguar's principal operating assets are located in the Iron Quadrangle, which is a greenstone belt in the state of Minas Gerais. Jaguar's common shares are listed on the Toronto Stock Exchange under the symbol JAG.

The MTL Complex is operated by Jaguar's wholly-owned subsidiary, Mineração Serras do Oeste (MSOL). The MTL Complex consists of Turmalina, including the Turmalina Mine, a processing plant (the Turmalina Plant), three satellite deposits (Faina, Pontal, and Zona Basal), and the Pitangui Project. The Turmalina Mine consists of several mineralized zones that are grouped into three orebodies – Orebodies A, B, and C. Two of the satellite deposits, Faina and Pontal, are located along strike to the northwest. The Zona Basal satellite deposit is located in the structural footwall of the current Turmalina mine workings, approximately three kilometers to the west. The Pitangui Project is located east of the Turmalina Mine and contains the São Sebastião gold deposit, which is approximately 20 km to the east of the Turmalina Plant.

Jaguar acquired the Turmalina Mine from AngloGold Ashanti Ltd. (AngloGold) in September 2004 and commenced mining operations in late 2006. The Turmalina Mine uses sublevel open stoping (SLOS) with backfill at a production rate of 1,100 tonnes per day (tpd) and ore is processed at the adjacent 2,000 tpd carbon-in-pulp (CIP) processing plant. At the Turmalina Plant, there are two lines of production that have the ability to run independently or combined in their CIP circuits. The first line consists of two ball mills (Mills #1 and #2), and the second line consists of a third ball mill (Mill #3).

Jaguar completed the acquisition of the Pitangui Project in September 2023 from IAMGOLD Corporation (IAMGOLD). Sources of Information

SLR has visited the MTL Complex a number of times, with the most recent site visit on December 8, 2022, carried out by Jeff Sepp, P.Eng., Consultant Mining Engineer, SLR and Reno Pressacco, P.Geo., Associate Principal Geologist, SLR. During the site visit, the style of the mineralization associated with Orebodies B and C was examined in underground exposures. The site visit also included a review of the style of the mineralization related to the Faina deposit by examination of a number of drill core intersections. Selected drill core that intersected the Pontal deposit was also examined.

During preparation of the updated Mineral Resource and Mineral Reserve estimates, discussions were held with the following personnel from Jaguar and Deswik Brazil Holdings Pty Ltd. (Deswik Brazil):

- Jonathan Victor Hill, VP, Geology & Exploration, Jaguar
- Elias de Oliveira Andrade, Technical Services Manager, Jaguar
- André Guimarães Pinto, Senior Geology Modeler, Jaguar
- Armando José Massucatto, Geology & Exploration Manager, Jaguar

- Afonso José Guedes Salles, Growth Projects Coordinator, Jaguar
- Bruno Tomaselli, Consulting Manager, Deswik Brazil
- Bruna Rozendo, Consulting, Deswik Brazil
- Gabriel Toledo, Consulting, Deswik Brazil

Table 2-1 presents a summary of the qualified person (QP) responsibilities for this Technical Report.

Table 2-1: Qualified Persons and Responsibilities

QP, Designation, Title	Responsible for
Jeff Sepp, P. Eng., Consultant Mining Engineer	1.1, 1.1.1.2, 1.1.2.2, 1.2, 1.3.5, 1.3.6, 1.3.11, 2, 3, 15,16, 21, 22, 24, 25.2, 26.2, 26.6, 30
Pierre Landry. P. Geo., Principal Geologist and Valuations Lead	1.1.1.1, 1.1.2.1, 1.3.4, 12, 14, 23, 25.1, 26.1
Reno Pressacco, P. Geo., Associate Principal Geologist	1.3.1–1.3.3, 4–11
Paul Hampton, P. Eng., Principal Metallurgist	1.1.1.3–1.1.1.4, 1.1.2.3–1.1.2.4, 1.3.7–1.3.7, 13, 17, 18, 25.3–25.4, 26.3–26.4
Jason J. Cox, P.Eng., Global Technical Director – Canada Mining Advisory	1.1.1.5, 1.1.2.5, 1.3.9–1.3.10, 19, 20, 25.5, 26.5
All	27

The documentation reviewed, and other sources of information, are listed at the end of this Technical Report in Section 27 References.

2.1 List of Abbreviations

Units of measurement used in this Technical Report conform to the metric system. All currency in this Technical Report is US dollars (US$) unless otherwise noted.

μ	micron
μg	microgram
a	annum
A	ampere
bbl	barrels
Btu	British thermal units
°C	degree Celsius
C$	Canadian dollars
cal	calorie
cfm	cubic feet per minute
cm	centimetre
cm^2	square centimetre
d	day
dia	diameter
dmt	dry metric tonne
dwt	dead-weight ton
°F	degree Fahrenheit
ft	foot
ft^2	square foot
ft^3	cubic foot
ft/s	foot per second
g	gram
G	giga (billion)
Gal	Imperial gallon
g/L	gram per litre
gpm	Imperial gallons per minute
g/t	gram per tonne
gr/ft^3	grain per cubic foot
gr/m^3	grain per cubic metre
ha	hectare
hp	horsepower
hr	hour
Hz	hertz
in.	inch
in^2	square inch
J	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km^2	square kilometre
km/h	kilometre per hour
kPa	kilopascal
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
L	litre
lb	pound
L/s	litres per second
m	metre
M	mega (million); molar
m^2	square metre
m^3	cubic metre
MASL	metres above sea level
m^3/h	cubic metres per hour
mi	mile
min	minute
μm	micrometre
mm	millimetre
mph	miles per hour
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
RL	relative elevation
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
V	volt
W	watt
wmt	wet metric tonne
wt%	weight percent
yd^3	cubic yard
yr	year

3.0 Reliance on Other Experts

This Technical Report has been prepared by SLR for Jaguar. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this Technical Report.
- Assumptions, conditions, and qualifications as set forth in this Technical Report.

For the purpose of this Technical Report, SLR has relied on ownership information provided by Jaguar. SLR has not researched property title or mineral rights for the MTL Complex and expresses no opinion as to the ownership status of the property.

SLR has relied on Jaguar for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the MTL Complex for preparation of the information presented in Section 22 Economic Analysis.

Except for the purposes legislated under provincial securities laws, any use of this Technical Report by any third party is at that party's sole risk.

4.0 Property Description and Location

4.1 Location

The MTL Complex is located approximately 120 km northwest of the Minas Gerais state capital of Belo Horizonte and approximately 10 km south of Pitangui, the nearest town of significant size (Figure 4-1). The MTL Complex has been expanded to include the Pitangui Project that was acquired as part of the purchase transaction completed with IAMGOLD in September 2023 (Jaguar, 2023b).

The Turmalina area of the MTL Complex is located in the municipality of Conceição do Pará. It currently produces gold from material excavated from Orebodies B and C; the ore is then processed at an onsite processing plant. Turmalina has geographic coordinates of 19°44’36.96” S latitude and 44°52’36.45” W longitude.

The Pitangui Project is located to the east of Turmalina, and it contains the São Sebastião deposit. The São Sebastião deposit is located approximately 20 km to the east of Turmalina and has geographic coordinates of approximately 19°44’ S latitude and 44°41.5 W longitude.

Figure 4-1: Location Map

Source: SLR, 2023.

4.2 Land Tenure

4.2.1 Introduction

Mining activities in Brazil are governed by the Brazilian Federal Constitution of 1988 (the Brazilian Federal Constitution), the Brazilian Mining Code (Federal Decree-Law No. 227/1967), and various other decrees, laws, ordinances, and regulations such as the Decree No. 9.406/2018 which renews the regulation of the Brazilian Mining Code. These regulations impose several obligations on mining companies pertaining to items such as the manner in which mineral deposits are exploited, the health and safety of the workers and local communities where mines are located, and environmental protection and remediation measures.

Under the Brazilian Federal Constitution, mineral rights are recognized as being distinct from surface rights and belonging exclusively to the Brazilian federal government. The Brazilian federal government is the sole entity responsible for governing mineral exploration and mining activities in Brazil.

Amongst other ministries and agencies, the Ministry of Mines and Energy (MME) and the National Mining Agency, or Agência Nacional de Mineração (ANM) in Portuguese, (formerly the Departamento Nacional de Produção Mineral (DNPM)) regulate mining activities in Brazil. The ANM is responsible for monitoring, analyzing, and promoting the performance of the Brazilian mineral industry by administering and granting rights related to the exploration and exploitation of mineral resources and other related activities in Brazil.

In Brazil, mineral resource tenure is achieved via exploration licenses (Autorizações de Pesquisa), mining concessions (Concessões de Lavra), mining concession applications (Requerimento de Lavra), and exploration license applications (Requerimentos de Pesquisa), which are together broadly referred to as mineral rights.

4.2.2 Mining Concessions and Exploration Licenses

Mining concessions have no set expiry date. Each year Jaguar is required to provide information to ANM summarizing mine production statistics through the annual mining report (Relatório Anual de Lavra).

Exploration licenses are granted for an initial period of three years. Once a company has applied for an exploration license, the applicant holds a priority right to the concession area as long as there is no previous ownership. The fees for holding the licenses during this initial three year phase is Brazilian Reais (R$) 4.09/ha, to be paid annually. The owner of the license can apply to have the exploration license renewed for a one time extension period up to three years. The fees for holding the licenses during the second phase is R$6.13/ha, to be paid annually. Renewal is at the sole discretion of ANM. Granted mining concessions and exploration licenses are published in the Official Gazette of the Republic (Diário Oficial da União - DOU), which lists individual concessions and their change in status. The exploration licenses and mining concessions grant the owner subsurface mineral rights, while surface rights can be applied for if the land is not owned by a third party.

The owner of an exploration license is guaranteed, by law, access to perform exploration field work, provided adequate compensation is paid to third party landowners and the owner accepts all environmental liabilities resulting from the exploration work. Exploration licenses are subject to annual fees based on their size (Taxa Anual por Hectare). A final report that provides the results of any exploration activities carried out is required to be filed with the ANM upon expiry of an exploration license.

4.2.2.1 Turmalina

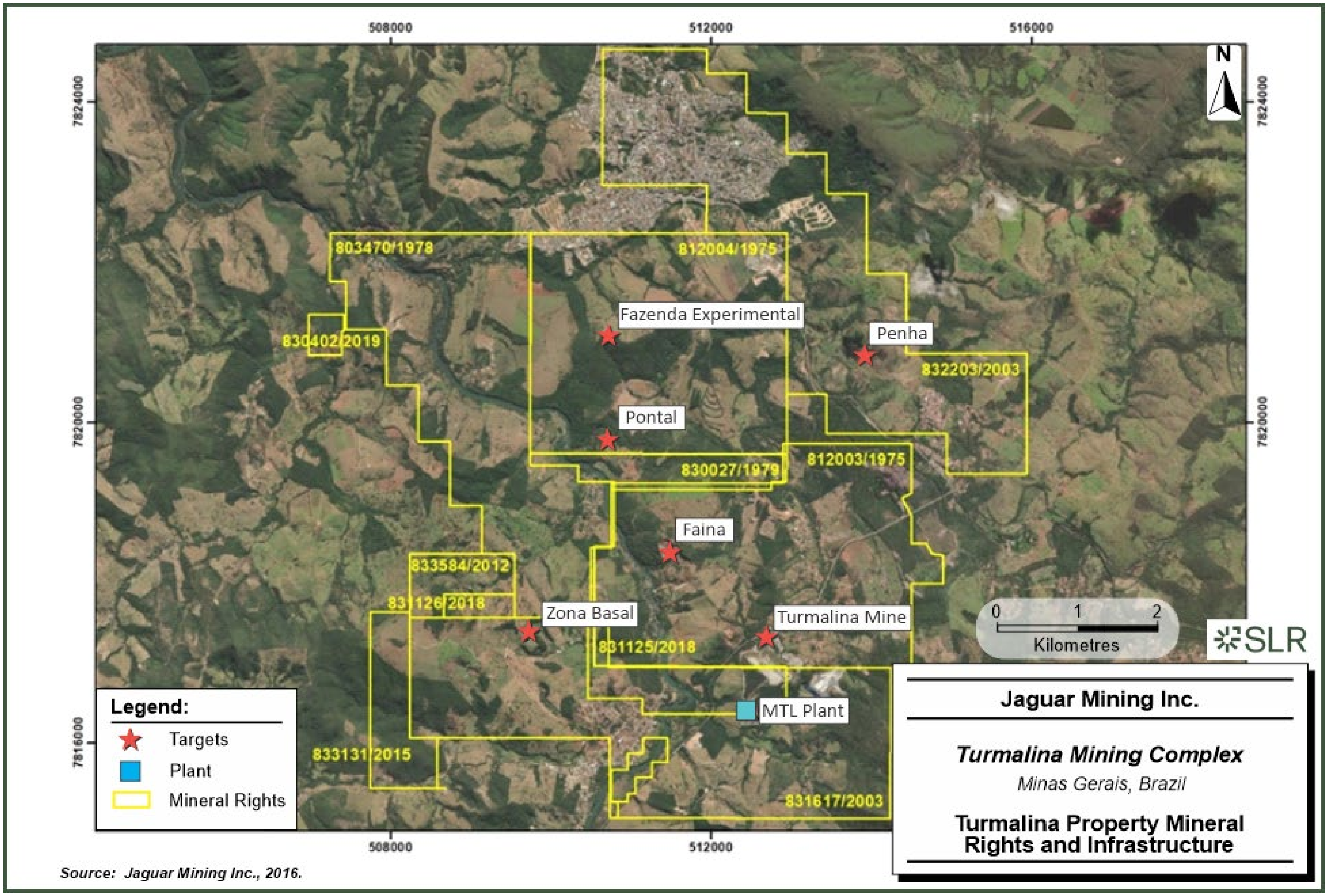
Turmalina comprises a number of contiguous mineral rights holdings granted by the ANM that, as of October 2023, cover an area of 2,932 ha of mining permits ("mining concessions"), 963 ha of mining permit requests, and 4,314 ha of active exploration permits ("exploration authorizations"), as summarized in Table 4-1. The locations of the mineral rights are illustrated in

Figure 4-2 and Figure 4-3, in relation to the Turmalina Plant and the mining industrial facilities, respectively. The locations of the mineral deposits are shown in Figure 4-2.

Table 4-1: Summary of Mineral Tenure and Requests for Turmalina as at October 2023

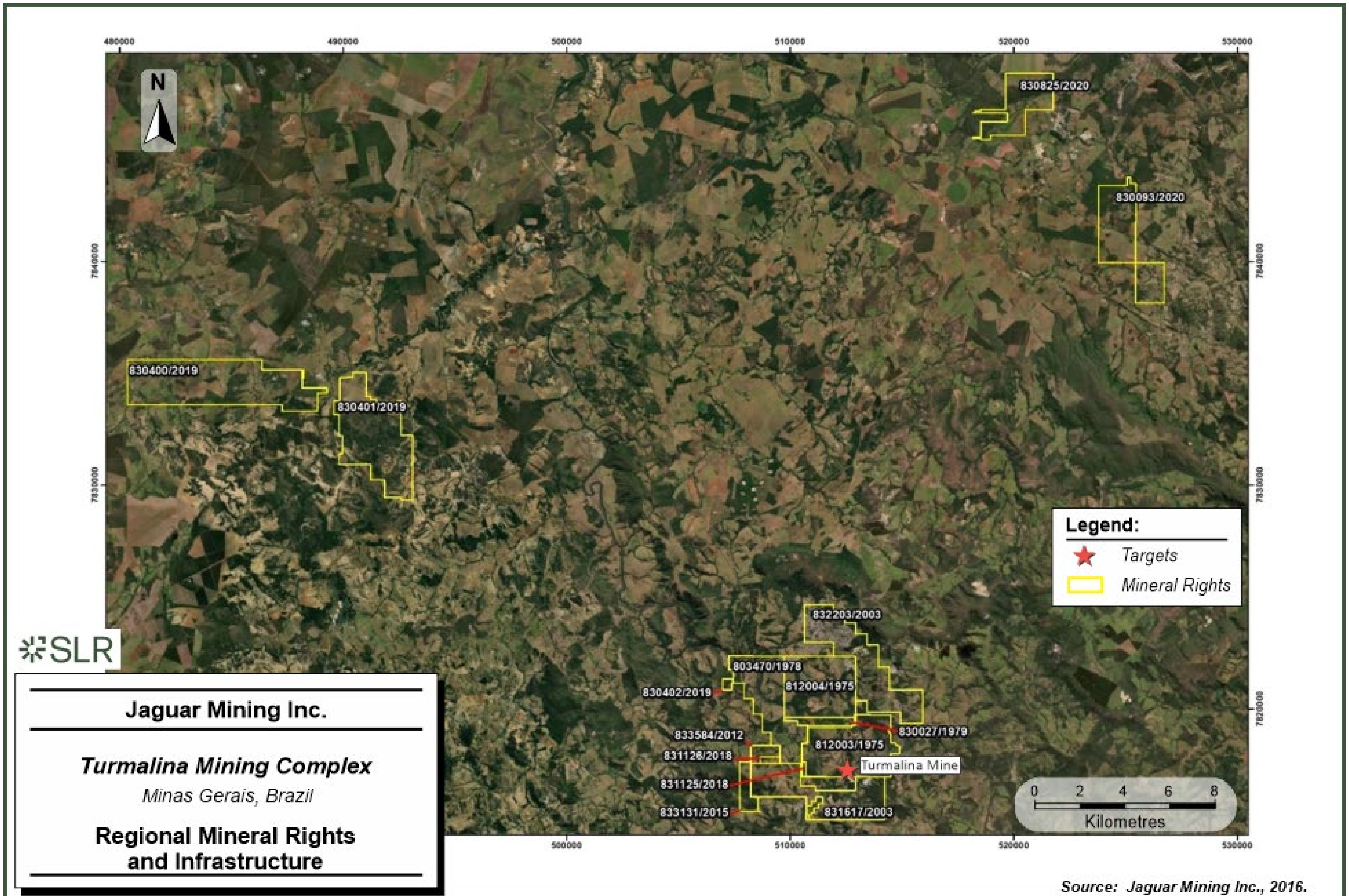
ANM Registry No.	Name of the Mineral Title	Licence Date DD/MM/YYYY	Area (ha)	Status
812.003/1975	Caquilho	11/09/1991	980.43	Mining Concession
812.004/1975	Varajo-Pontal e Ltamar	04/09/1991	880.00	Mining Concession
803.470/1978	Rio S. João	25/04/1995	952.00	Mining Concession
830.027/1979	Pontal	26/04/1995	120.00	Mining Concession
930.086/2005	Turmalina Mining Group	26/02/2010	n/a	Group Mining Concessions
Total Mining Concession			2,932.43	
831.126.2018	Zona Basal	06/09/2018	26.13	Mining Request
833.584/2012	Zona Basal	16/04/2018	77.87	Mining Request
831.617/2003	Rio S. João	21/07/2010	858.71	Mining Request
Total Mining Request			962.71	
831.125/2018	Zona Basal	06/09/2018	11.68	Exploration Authorization
831.131/2015	Zona Basal	19/02/2016	131.15	Exploration Authorization
830.400/2019	Bom Despacho/Leandro Feirreira	25/05/2020	1,591.90	Exploration Authorization
830.401./2019	Bom Despacho/Leandro Feirreira	25/05/2020	1,213.09	Exploration Authorization
830.402/2019	Conceição do Pará	25/05/2020	21.08	Exploration Authorization
830.093/2020	Pappagaios e Maravilhas	12/08/2020	810.91	Exploration Authorization
830.825/2020	Papagaios	04/02/2022	534.54	Exploration Authorization
Total Exploration Authorization			4,314.35	

Figure 4-2: Property Mineral Rights and Infrastructure



Source: Jaguar Mining Inc., 2016.

Figure 4-3: Regional Mineral Rights and Infrastructure



Source: Jaguar Mining Inc., 2016.

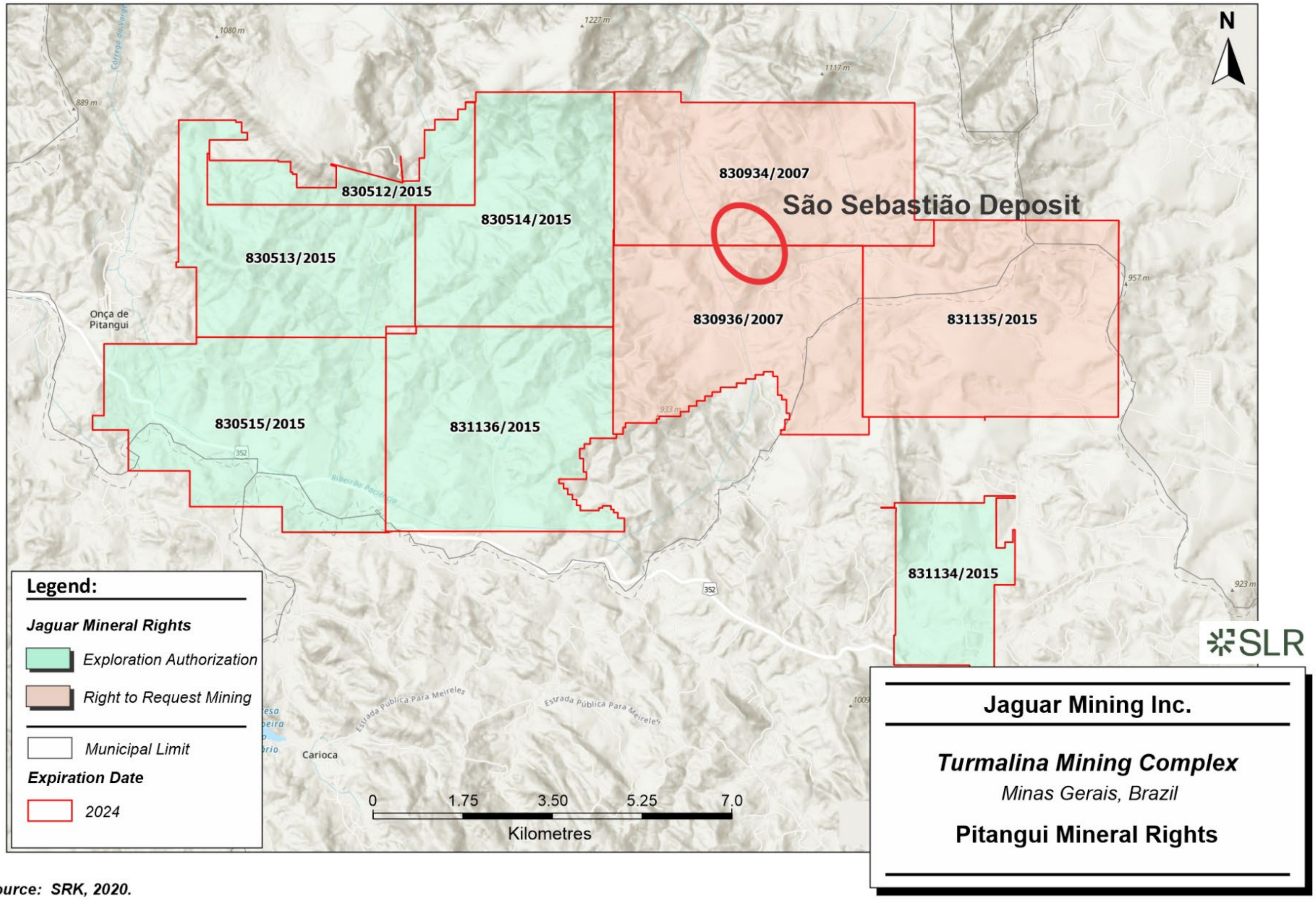
4.2.2.2 Pitangui Project

The Pitangui Project comprises eight contiguous mineral rights holdings granted by the ANM that, as of October 2023, cover an area of 11,787.67 ha of active exploration permits ("exploration authorizations"), as summarized in Table 4-2. Additionally, a ninth, non-contiguous mineral claim was acquired in 2023 bringing the total claim area to 12,534.16 ha. The locations of the mineral rights are illustrated in Figure 4-4. 'Mining Requests' is a petition requesting the granting of mineral exploitation through the submission of the Economic Exploitation Plan (PAE) for mining, aimed at the extraction, beneficiation, and commercialization of the mineral identified in the previous stage of exploration authorization.

Table 4-2: Summary of Mineral Rights for the Pitangui Project as at October 2023

ANM Registry No.	Area (ha)	Licence Date DD/MM/YYYY	Expiry Date DD/MM/YYYY	Status
830.934/2007	1,686.09	18/02/2009	03/04/2024	Mining Request Final report approved: Updated report submitted
830.936/2007	1,593.54	27/11/2008	03/04/2024	Mining Request Final report approved: Updated report submitted
830.512/2015	446.71	26/08/2016	07/02/2026	Exploration Authorization
830.513/2015	1,259.05	22/08/2016	04/05/2024	Exploration Authorization
830.514/2015	1,519.58	26/08/2016	04/05/2024	Exploration Authorization
830.515/2015	1,749.47	26/08/2016	04/05/2024	Exploration Authorization
831.134/2015	746.72	06/08/2021	01/10/2024	Exploration Authorization
831.135/2015	1,850.67	26/10/2015	28/09/2024	Mining Request
831.136/2015	1,682.33	26/08/2016	04/05/2024	Exploration Authorization
Total	**12,534.16**			

Figure 4-4: Pitangui Project Mineral Rights



Source: SRK, 2020.

4.2.3 Surface Rights

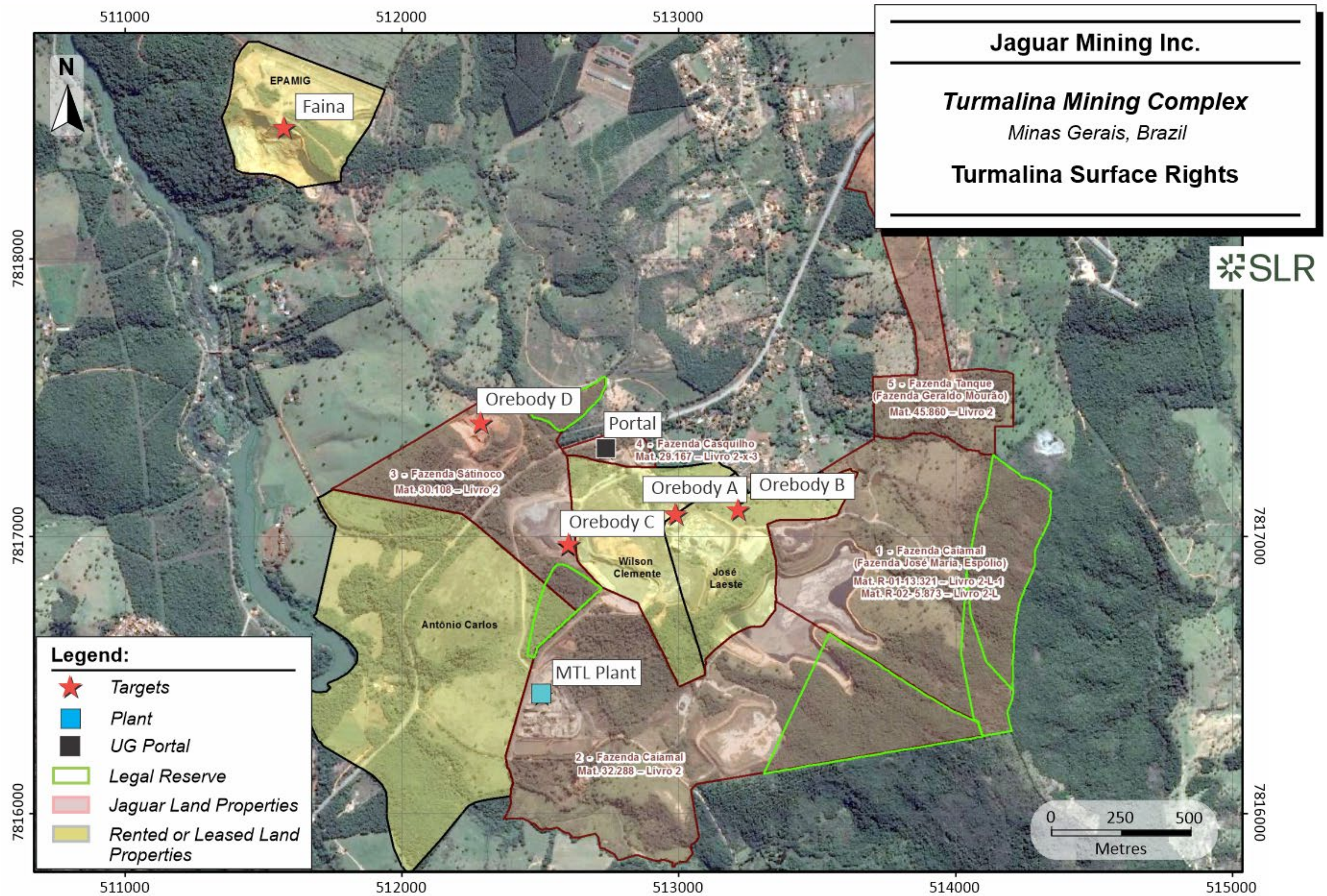
4.2.3.1 Turmalina

A summary of the surface rights holdings in 2023 is provided in Table 4-3. The location of the surface rights around Turmalina are illustrated in Figure 4-5.

Table 4-3: Summary of Surface Rights as at October 2023

Name	Registry Number	Location	Area (ha)	Status	20% Area Forest Legal Reserve
Fazenda Caiamal (Fazenda José Maria, Espólio)	Mat. R-01-13.321 – Livro 2 – Área: 40 ha / Mat. R-02- 5.873 – Livro 2 – Área: 31.5 ha	Tailings Dam (partial)	71.5	Active	The legal reserve of a total of 18.81 ha is in good standing but the registration at the public notary is still pending.
Fazenda Caiamal (Fazenda Barbiere)	Mat. 32.288 – Livro 2	Processing Plant, Fill Plant, Tailings Dam and Core shack	96	Active	Legal Reserve is in good standing. Area of 19.50 ha.
Fazenda Irmãos Freitas (Caca / Antônio Carlos Alves De Freitas)	Mat. 30.108 – Livro 2	Orebodies C and D	30	Active	Legal reserve established in name of IBDF (Instituto Brasileiro de Florestas), according to AV – 1 – 30108-03/07/2003, Registration of Legal reserve in name of Jaguar pending.
Fazenda Casquilho (Alexandre Ferreira Da Silva)	-	Office, Mess, Mechanic Shop and Decline Portal	3	Active	No Forest legal reserve registered as the area has no more available forest
Fazenda Tanque	Pending	Down Dip Projection of Orebodies A & B	25		
Fazenda Açoita-Cavalo	Mat. Nº 48.220 (regularization process)	Zona Basal Exploration	24.4	Active	

Figure 4-5: Surface Rights Locations



Source: Jaguar Mining Inc., 2016.

4.2.3.2 Pitangui Project

No surface rights have been obtained for the Pitangui Project.

4.3 Encumbrances

SLR is not aware of any encumbrances related to Turmalina or the Pitangui Project.

4.4 Royalties

4.4.1 Turmalina

Jaguar acquired Turmalina from AngloGold in September 2004. Jaguar, through its wholly-owned subsidiary, MSOL, holds 100% ownership of Turmalina, subject to a 5% net revenue interest up to $10 million, and 3% thereafter, to an independent third party. In addition, there is a 0.5% net revenue interest payable to the surface landowner. A summary of the mineral rights royalties and surface rights royalties paid in 2022 is provided in Table 4-4.

Table 4-4: Summary of Royalty Payments, Concession No. 812.003/1975

Mineral Rights Royalties				
Holder	Royalty	Orebody	Payment Status in R$	
			Status	Paid in 2023
Eduardo C. de Fonseca	5% of the Production Gross Profits until reaching US$10 million during current fiscal year, then 3% of the Production Gross Profit	A, B and C	Inactive	-
Carlos Andraus / Mirra Empreend. E Participações Ltda.			Active (30%)	2,745,751.19
Vera A. Di Pace / Vermar Empreend. E Participações Ltda.			Active (30%)	2,745,751.19
Paulo C. De Fonseca / Sandalo Empreend. E Participações Ltda.			Active (16%)	1,464,400.63
Clara Darghan/Mocla Empreend. E Participações Ltda.			Active (12%)	4,007,658.96
Eduardo Camiz de F. Junior / Agro Pecuária Aldebaram Empreend. Ltda.			Active (12%)	1,098,300.46
Surface Rights Royalties				
Holder	**Refers to**	**Orebody**	**Payment Status in R$**	
			Base Value	**Paid in 2023**
José Laeste de Lacerda	Surface	A, B and C	14,812.00	177,744.00
Wilson Clemente de Faria	Building rent		13,570.00	196,296.00
	Surface		2,788.00	
EPAMIG	Surface	Faina	35,000.00	420.000.00
Moreiras Empreendimentos	Surface	Faina	-	27,511.36
Familia Freitas	Water pipe	A, B and C	13,200.00	213,840.00
	Water well		1,980.00	
	Road access		2,904.00	

4.4.2 Pitangui Project

In consideration for acquiring a 100% interest in the Pitangui Project from IAMGOLD, Jaguar has agreed to grant IAMGOLD a net smelter returns (NSR) royalty which will be calculated as follows:

In the case of gold (not including silver or other metals) from the Pitangui Project, Jaguar will pay IAMGOLD a royalty of US$80 per ounce for the initial 250,000 ounces of gold sold from the

Pitangui Project. Following the initial 250,000 ounces of gold sold, the amount of the royalty payable to IAMGOLD for any applicable calendar quarter will be the result obtained by multiplying the NSR for such calendar quarter by 1.5% (Jaguar 2023c).

4.5 Permits and Other

Key licenses to operate and environmental and other permits relating to the MTL Complex are discussed in Section 20 of this Technical Report.

SLR is not aware of any environmental liabilities on the property. Jaguar has all required permits to conduct the proposed work on the property. SLR is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

5.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

The MTL Complex is accessed from Belo Horizonte by taking highway BR-381 and connecting paved highways (BR-262 and BR-352 or MG-423) for approximately 120 km, continuing on to the town of Pitangui. The Turmalina deposits are located approximately 10 km south of the town of Pitangui and less than one kilometre from Highway MG-423.

Access to the Pitangui Project area follows nearly the same route along highway BR-262, which leads northwest to the city of Pará de Minas. From Pará de Minas, the project area can be reached via several unpaved roads that branch off from MG-431 and BR-352. The highways and unpaved roads are generally in acceptable to good condition.

Belo Horizonte is the commercial center for Brazil's mining industries and has excellent infrastructure to support world-class mining operations. This mining region has historically produced significant quantities of gold and iron from open pit and large-scale underground mining operations operated by AngloGold, VALE, CSN, and Eldorado. The city of Belo Horizonte has a population of approximately 6.2 million residents, and has substantial infrastructure including two airports, an extensive network of paved highways, a fully developed and reliable power grid, and ready access to processed and potable water. It hosts several state and federal government agencies as well as a number of private businesses that provide services and support to the mining industry in the region. Jaguar maintains a corporate office in Belo Horizonte.

Pitangui is a town of approximately 25,000 people. The local economy is based on agriculture, cattle breeding, and a small pig iron plant. Workforce, energy, and water are readily available.

The city of Pará de Minas is located approximately 12 km to the southeast of the São Sebastião deposit and is located in the centre of the municipality of Parã de Minas, which has a population of approximately 93,000. This city hosts the strongest economy in the region, driven primarily by chicken and cattle farms and several vegetable plantations.

5.2 Climate and Physiography

The MTL Complex is at an elevation of approximately 700 MASL. The Pitangui area terrain is rugged in places, with numerous rolling hills incised by deep gullies along drainage channels. Farming and ranching activities are carried out in approximately 50% of the region.

The dominant climate in the region is temperate, with average annual temperatures hovering around 26°C. In the winter period, minimum temperatures of 10°C are noted. In the summer, there are a few records above 32°C. According to the Köppen classification, the regional climate is classified as Cwb, mesothermal, with mild summers and dry autumn and winter seasons.

There are two distinct seasons: the rainy summer, usually from October to March, and the dry winter, from April to September. The average annual rainfall is around 1,650 mm and the rainiest months are December and January. The relative humidity of the air ranges from 75% to 85%. Operations take place year round.

5.3 Vegetation

The region is located in the western portion of the Atlantic Province, also known as the Atlantic Morphoclimatic Domain or Atlantic Forest Biome. In the Vegetation Map of Brazil (IBGE, 1993) this region ranges from seasonal semideciduous forest and cerrado (woodland savannah).

The forests of this area, when fully grown and depending on the soil, have trees up to 30 m in height. At this stage, they have a defined stratification, with a low dense understory composed of shrubs and trees.

The predominant vegetation is the cerrado, with small trees and shrubs. Large areas are now transformed into pastures. Along the Pará River and its tributary streams, riparian forests are characterized by medium-sized trees.

Due to long term and ongoing human settlement in the region, the vegetation cover has generally been replaced with secondary formations and pastures. The various forest fragments still observed in the region are at a secondary stage, resulting from regeneration.

5.4 Soil Aspects

Where well defined, the soils have little variability in appearance, with a clear predominance of silty-clayey soils with a pink to brownish color, resulting from the decomposition of phyllites/schists, widely distributed in the area.

The soils are better exposed on the slopes of the valleys, due to colluvium concentrations. In the higher lands, where the most widely spaced vegetation predominates, there are little developed and stony soils.

5.5 Local Resources

Belo Horizonte is one of the world's mining capitals, with a regional population of approximately six million people. Automobile manufacturing and mining services dominate the economy. Mining activities in Belo Horizonte and the surrounding area have been carried out for over 300 years. The MTL Complex is approximately two to three hours by road from Belo Horizonte.

5.6 Infrastructure

The Complex includes the Turmalina Plant, with a nominal capacity of 2,000 tpd and tailings disposal area. Electrical power is obtained from the national grid.

Most ancillary buildings, including the gate house including a reception area and waiting room, administration building, maintenance shops, restaurant, warehouse, change room, first aid, and compressor room, are located near the Turmalina entrance. The explosives warehouse is located 1.2 km away from the mine area, in compliance with the regulations set forth by the Brazilian Army.

Other ancillary buildings are located near the Turmalina Plant and include an office building, a laboratory, warehouse, and a small maintenance shop. There is currently no infrastructure related to the Faina and Pontal historic open pit operations.

It is anticipated that a conceptual underground operating scenario for the Pitangui Project would require a connection to the Brazilian national power grid via a 16 km long, 13.8 kV dedicated transmission line between the site and a substation located at Pará de Minas town.

The potential water infrastructure for the fresh water supply source may be the gorge near Jaguara, 1.5 km northeast of the Pitangui ore deposit boundary. Once underground operations have been established, the main water sources for the Pitangui operations would be water pumped from the underground mine, run-off water collected in the TSF, and recirculated effluent from the process plant.

6.0 History

6.1 Prior Ownership

6.1.1 Turmalina

Gold was first discovered in the Turmalina area in the 17th century, and through the 19th century, intermittent small scale production took place from alluvial terraces and outcropping quartz veins. Gold production exploited alluvium or weathered material, including saprolite and saprolite hosted quartz veins. Records from this historical period are few and incomplete.

From 1978 to 2004, AngloGold, through a number of Brazilian subsidiaries, held the mineral rights to Turmalina. AngloGold explored the Turmalina area extensively between 1979 and 1988 using geochemistry, ground geophysics, and trenching, which led to the discovery of the Turmalina, Satinoco (now referred to as Orebody C), Faina, and Pontal deposits, and other mineralized zones. Initial exploration work at Orebody A included 22 surface based diamond drill holes totalling 5,439 m to test the downward extension of the sulphide mineralized body. At the Satinoco target (Orebody C), a total of 1,523 m was drilled in nine holes.

Jaguar acquired Turmalina in 2004 and continued operation of the Turmalina Mine.

6.1.2 Pitangui Project

The following is excerpted from SRK (2020):

"The Pitangui Project is located at the north-west extension of the Quadrilátero Ferrifero, which hosts a number of significant mineral deposits, iron and gold being the most economically important. The discovery of gold in the Pitangui region dates back to the early 18th century and modern gold exploration in the Pitangui greenstone belt began in the late 20th century. Regional scale exploration in the Pitangui greenstone belt was conducted by Anglo American and its subsidiary Unigeo, replaced by AngloGold, between the late 1970s and early 1990s, culminating in the discovery of what is now the Turmalina Mine approximately 20 km to the west of the São Sebastião gold deposit."

6.2 Exploration and Development History

6.2.1 Turmalina

In 1992 and 1993, AngloGold mined 373,000 t of oxide ore from open pits at the Turmalina, Satinoco (Orebody C), Pontal, and Faina zones, recovering approximately 35,500 oz Au using heap leach technology. Subsequently, AngloGold drove a ramp beneath the Turmalina pit and carried out drifting on two levels in the mineralized zone at approximately 50 m and 75 m below the pit floor to explore the downward extension of the sulphide mineralized body.

The Turmalina Mine is accessed from a 5.0 m x 5.5 m primary decline located in the footwall of the main deposit. As of July 2023, the decline at Orebody A has reached a vertical depth of approximately 1,085 m below surface. Mining activities on Orebody A have been suspended as of December 2022 with Orebody C becoming the principal production source. Access to Orebody C is via a dedicated adit and ramp located southwest of the Turmalina Plant. Additional access to Orebody C is via several branches off of the primary decline at the 550 m, 440 m, and 70 m elevations (approximately 140 m, 260 m, and 630 m below surface, respectively). As of July

2023, the deepest access on Orebody C has achieved a depth of approximately 670 m below surface.

6.2.2 Pitangui Project

The following is excerpted from SRK (2020):

"No record of exploration work on the Pitangui Project is known prior to the exploration activities carried out by IAMGOLD. The Pitangui applications and concessions were originally claimed to gain the mineral right control over some of the most promising lithologies and structures detected from field reconnaissance work and by the interpretation of a Minas Gerais State sponsored airborne geophysical survey.

Initial exploration by IAMGOLD started in 2009 with the regional geological mapping and a soil geochemistry grid program over concessions covering what is now the São Sebastião gold deposit. The first drilling campaign was conducted in the latter half of 2011 and nearly 88,000 metres of drilling have been completed up to July 2019."

A summary of exploration activities carried out by IAMGOLD is presented in Table 6-1.

Table 6-1: Summary of IAMGOLD Exploration Activities 2007-2019

Year	Work Type	Summary of Work
2007	Geological reconnaissance	200 sq. km. of area covered, 19 rock chip samples collected
2009	Geological reconnaissance	109 stream sediment samples collected
2009 - 2010	Geological reconnaissance	150 sq. km of regional-scale geological mapping completed. Geochemical surveys completed over two areas using a sample grid of 400 m x 50 m. Several gold anomalies discovered, including what is now the São Sebastião deposit.
2011	Diamond drilling	Initial drill holes completed to test both areas of anomalous gold values. Initial discovery of mineralization at the São Sebastião deposit.
2012	Airborne VTEM survey	A total of 617.5 line-kilometres of survey completed by Geotech Ltd on the eastern portion of the Pitangui Project.
	Airborne magnetic survey	Survey completed using an unmanned aerial vehicle by Status Aeronautics. A total of 473 line-kilometres of survey completed on the northwestern portion of the Pitangui Project.
2012 to 2016	Ground geophysical surveying	Surveys focused on the area around the São Sebastião deposit. Survey methods included Induced Polarization/Resistivity, Down-Hole Induced Polarization, Time-Domain Electromagnetic, Borehole Electromagnetic techniques. Induced Polarization, Time Domain Electromagnetic and Borehole Electromagnetic surveys were also carried out over regional targets (Aparição and Vilaça).

Year	Work Type	Summary of Work
	Geochemical surveying and geological mapping	Surface geochemistry programs and geological mapping were extended towards the north and northeast areas of the Project. These surveys located the Aparição target located approximately four to six kilometres southeast of the São Sebastião deposit, and the Vilaça target located approximately nine kilometres north-northeast of the São Sebastião deposit.
2011 to 2019	Diamond drilling	A total of 88,034 m of drilling completed.

6.3 Historical Resource Estimates

SLR is not aware of any historical Mineral Resource or Mineral Reserve estimates for Turmalina.

A historical Mineral Resource estimate is present for the São Sebastiao deposit located on the Pitangui claim block that has newly been acquired by Jaguar from IAMGOLD. An NI 43-101 compliant Mineral Resource estimate of the mineralization found at the São Sebastiao deposit was prepared for IAMGOLD in 2019 and was most recently disclosed in a Technical Report with an effective date of December 2, 2019 (SRK, 2021).

The Mineral Resource estimate was prepared using 3D block modelling and the ordinary kriging (OK) interpolation method for a corridor of the Pike Lake Project with a strike length of approximately 4.1 km and a width of approximately 1.5 km, down to a vertical depth of approximately 300 m below surface. Twenty one mineralized zones have been interpreted using the Leapfrog Edge software package from a drill hole database containing a total of 216 drill holes. A minimum width of two metres was applied when preparing the mineralized wireframe interpretations.

The Mineral Resource statement was prepared by applying a block cut-off grade of 2.5 g/t Au to represent that mineralization with the potential of being extracted using underground mining methods. The input parameters used to estimate the cut-off grade are presented in Table 6-2.

Table 6-2: Conceptual Assumptions Considered for Underground Resource Reporting

Parameter	Units	Value
Gold price	US$/oz	1,500
Exchange rate	US$ / C$	1.10
Mining costs	US$/t mined	31.70
Processing costs	US$/t of feed	50.70
General and Administration	US$/t of feed	5.30
Mining dilution	%	20
Mining recovery	%	85
Process recovery	%	93
Assumed process rate	tpa	400,000
Assumed mining rate	tpd	1,100

Source: SRK, 2021.

The historical Mineral Resource estimate for the São Sebastiao deposit is summarized in Table 6-3.

Table 6-3: Historical Mineral Resource Estimate, São Sebastiao Deposit

Category	Quantity (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated	3,330	4.39	470
Inferred	3,559	3.78	433

Notes:

1. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.
2. All figures have been rounded to reflect the relative accuracy of the estimates.
3. Reported at underground resource cut-off grades of 2.5 g/t gold. Cut-off grades are based on a price of US$1,500 per ounce of gold and gold recoveries of 93%.

Source: SRK (2021)

This estimate is considered to be historical in nature and should not be relied upon. This historical estimate has been superseded by the current Mineral Resource estimate prepared by the SLR QP in Section 14 of this Technical Report.

6.4 Past Production

In total, the Turmalina Plant has processed approximately 8.0 million tonnes (Mt) of ore to produce a total of approximately 844,000 oz Au at an average recovered grade of 2.98 g/t Au (Table 6-4). This production includes a small quantity of material that was processed prior to Jaguar's ownership, the sulphide material extracted by Jaguar from Orebodies A, B, and C, and the oxide portions of the Orebody D, Faina, and Pontal deposits that were amenable to treatment at the existing plant.

Production from the Faina deposit open pit mine took place intermittently over a three year period between June 2010 and June 2013. No significant production has occurred from the Zona Basal deposit.

No significant production of gold has occurred on the Pitangui Project.

Table 6-4: Production History and Mill Recovery

Year	Tonnage Milled (000 t)	Feed Grade (g/t Au)	Recovered Grade (g/t Au)	Recovery (%)	Gold Produced (oz)
1992–1993	373	-	2.96	-	35,500
Q4 2006	9	2.58	-	91.5	678
2007	347	5.08	4.40	86.6	44,515
2008	481	5.46	4.83	88.5	72,514
2009	588	4.81	4.29	89.1	73,589
2010	692	3.20	2.80	87.4	61,860
2011	655	3.32	2.96	89.2	61,676
2012	473	2.48	2.21	89.2	37,840

Year	Tonnage Milled (000 t)	Feed Grade (g/t Au)	Recovered Grade (g/t Au)	Recovery (%)	Gold Produced (oz)
2013	457	3.24	2.87	88.7	43,424
2014	442	3.69	3.32	90.0	47,993
2015	406	4.14	3.77	91.0	50,658
2016	502	3.89	3.56	91.5	63,258
2017	427	3.48	3.17	91.0	45,466
2018	322	3.44	3.12	90.7	33,261
2019	334	3.15	2.83	89.9	33,400
2020	370	3.65	3.26	89.3	40,067
2021	410	3.12	2.76	88.6	37,505
2022	392	3.35	2.93	87.4	36,165
2023[1]	309	2.76	2.38	86.2	24,660
Total	**7,989**	**3.50**	**2.98**	**84.9**	**844,029**

[1]Note: The production data for 2023 includes data from January 1 to September 30, not just until July 31, for completeness as it was also available at the time of report writing.

7.0 Geological Setting and Mineralization

7.1 Regional Geology

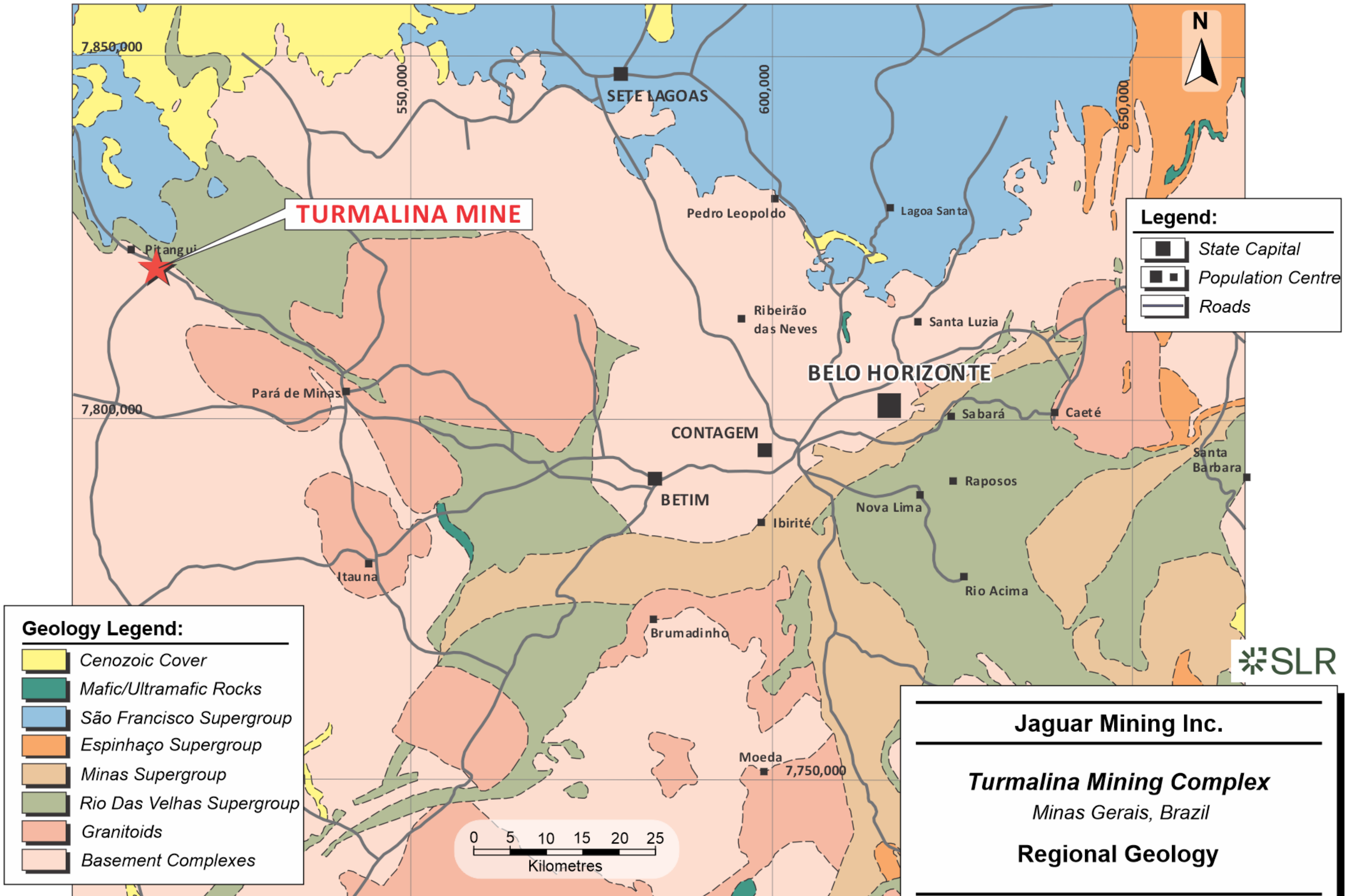
The Turmalina deposits are located in the western part of the Iron Quadrangle, which was the principal region for Brazilian hard rock gold mining until the early 1980s, when the Carajás mineral province, in the state of Pará, attained equal status. Many commodities are mined in the Iron Quadrangle, the most important being gold, iron, manganese, bauxite, imperial topaz, and limestone. Until the early 1980s the Iron Quadrangle accounted for approximately 40% of Brazil's total gold production. Gold was produced from numerous deposits, primarily in the northern and southeastern parts of the Iron Quadrangle, hosted by Archean or Early Proterozoic banded iron formations (BIF) contained within greenstone belt supracrustal sequences.

In the type-locality Brumal-Pilar region (in Santa Bárbara County, where Jaguar´s Pilar mine is located), outcrops belonging to the granitic gneissic basement, and to the Nova Lima and Quebra-Ossos groups of the Rio das Velhas Supergroup occur. The granitic gneissic basement consists of leucocratic and homogeneous gneisses and migmatites, making up a complex of an initial tonalitic composition intruded by Archean rocks of granitic composition. The upper contact of the sequence is discordant and tectonically induced by reverse faulting. The Rio das Velhas Supergroup is represented in the region by meta-mafic, meta-volcaniclastic and meta-epiclastic schists of the Nova Lima Group, and by meta-ultramafic and meta-mafic rocks of the Quebra-Ossos Group including serpentinites, talc schists, and metabasalts.

"Algoma-type" iron formations occur as the more prominent volcanogenic-sedimentary rocks in the Nova Lima Group, as individual layers with thicknesses of up to 15 m. The Nova Lima Group can be subdivided into three units: a) A basal unit composed of mafic (basic) to intermediate meta-volcanic rocks interlayered with meta-pelites, Algoma-type BIFs, and rare acidic meta-volcaniclastic rocks; b) An intermediate unit represented by mafic to felsic volcanic rocks and volcaniclastic rocks interlayered with graphitic phyllite and horizons of Algoma-type BIF; and c) An upper unit composed of meta-pelites interlayered with felsic meta-volcanic rocks and meta-volcaniclastic rocks, quartzites, and meta-conglomerates.

The broad regional geology of the Iron Quadrangle is shown in Figure 7-1.

Figure 7-1: Regional Geology



Source: Jaguar Mining Inc., 2020.

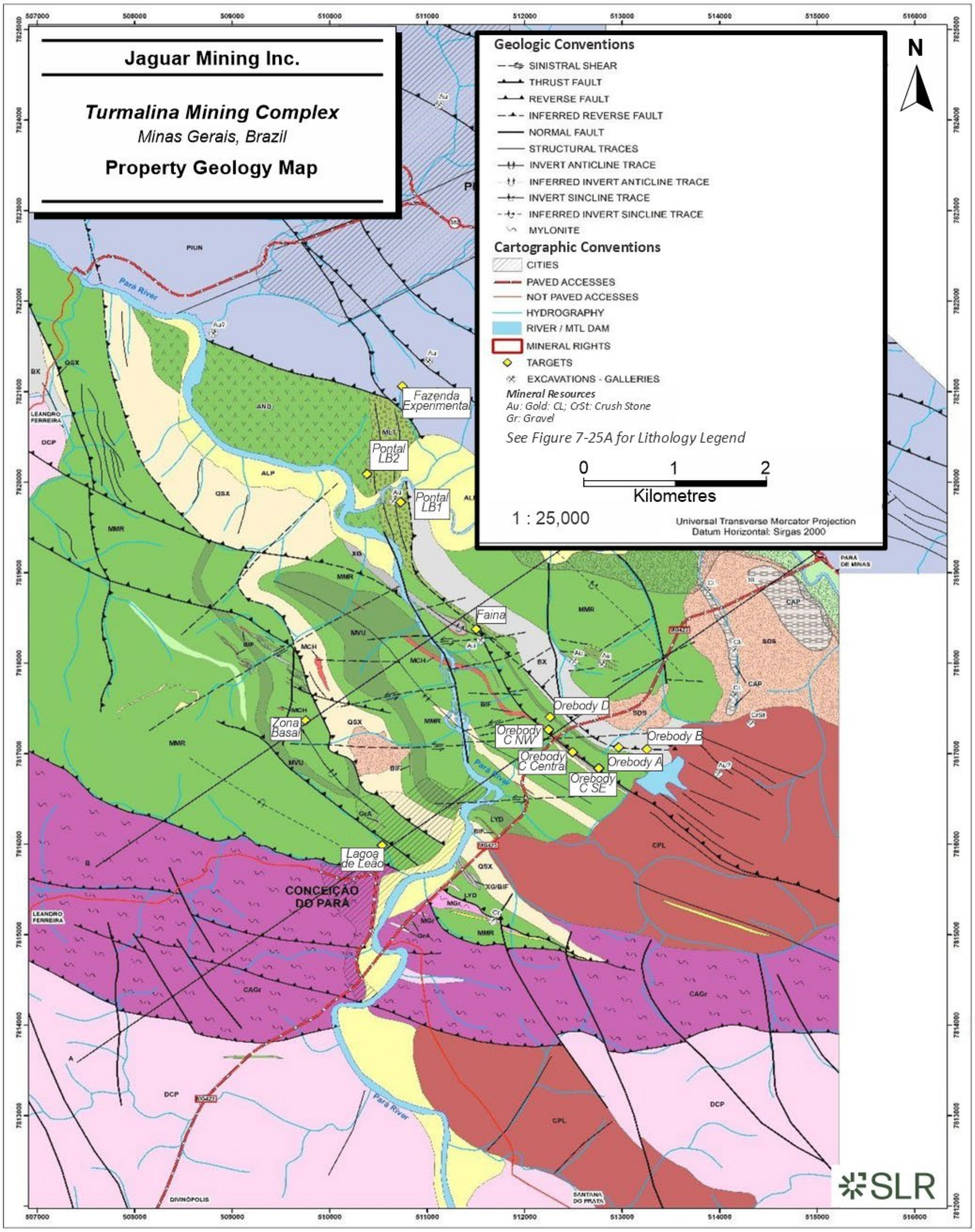
7.2 Property Geology

7.2.1 Turmalina

A 2020 detailed surface map of the property geology of the Turmalina area is presented in Figure 7-2 (legend in Figure 7-2A). The mine sequence (part of the Pitangui Group) consists of bedded metasediments including quartz-sericite schists and sericite-chlorite-biotite schists, mafic volcanic rocks including amphibole-plagioclase-quartz-chlorite schists, and horizons of meta-cherts, banded ironstones (BIFs), and black carbonaceous schists. All lithologic types of the stratigraphic units of the Turmalina deposit have been metamorphosed to the amphibolite facies.

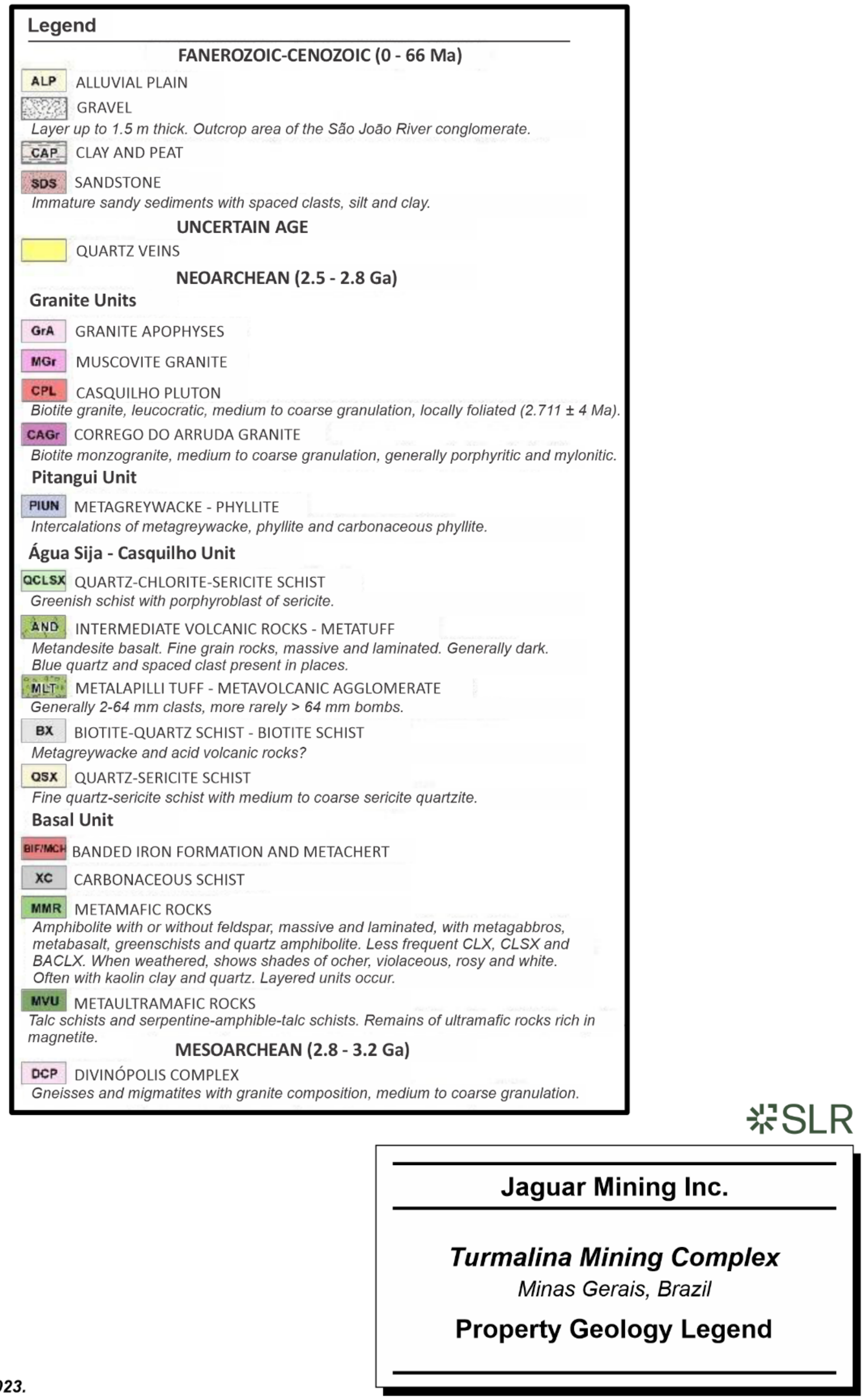
The following section provides more detailed insights into the geological-structural features of the Turmalina deposit, including the nature of deformation events, orientations of cleavages and lineations, and the spatial control of economic bodies.

Figure 7-2: Property Geology Map



Source: Jaguar Mining Inc., 2020.

Figure 7-2A: Property Geology Legend



Source: Jaguar Mining Inc., 2023.

Figure 7-3 presents an example of intersection lineations between bedding planes/S_0 and the main penetrative tectonic cleavage/Sn, observed and mapped underground in all ore zones of the Turmalina deposit. This interpreted spatial "linear control" for the ore zones of the Turmalina deposit would also correspond to the orientation of axes of hypothetical (plunging and overturned) major/high-amplitude Dn/Fn folds that deformed regional stratigraphic packages of the Pitangui greenstone belt.

Figure 7-4 shows an integrated, composite plan view of Orebody A of the Turmalina Mine, from the shallow operational Level 2 into the deep operational Level 16. The red outlines trending to the Northeast in Figure 7-4 depict changes in the shape of Orebody A where it intersects each mining level, and follows the direction of the intersection lineation. Figure 7-5 provides a similar diagram for Orebody B, illustrating the relationship between the orebody intersections at each mining level, bedding planes, foliation, and the intersection lineation.

Figure 7-3: View of Stretching Lineations and Stereonets, Orebody A

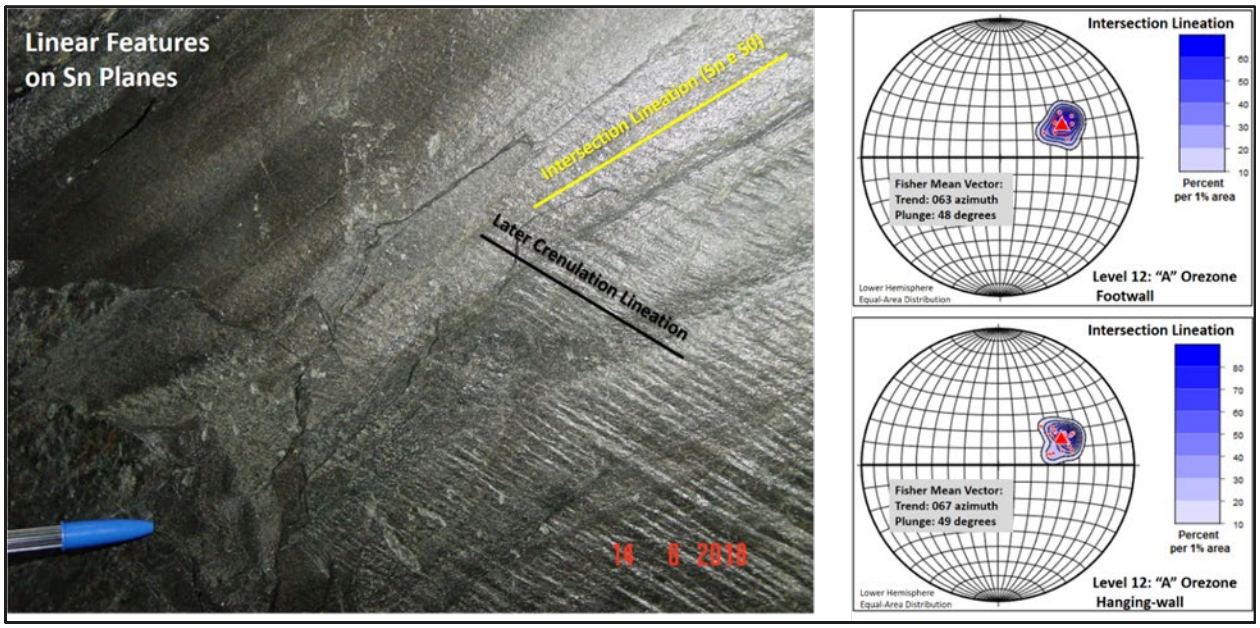


Figure 7-4: Plan View of the Structural Features of Orebody A

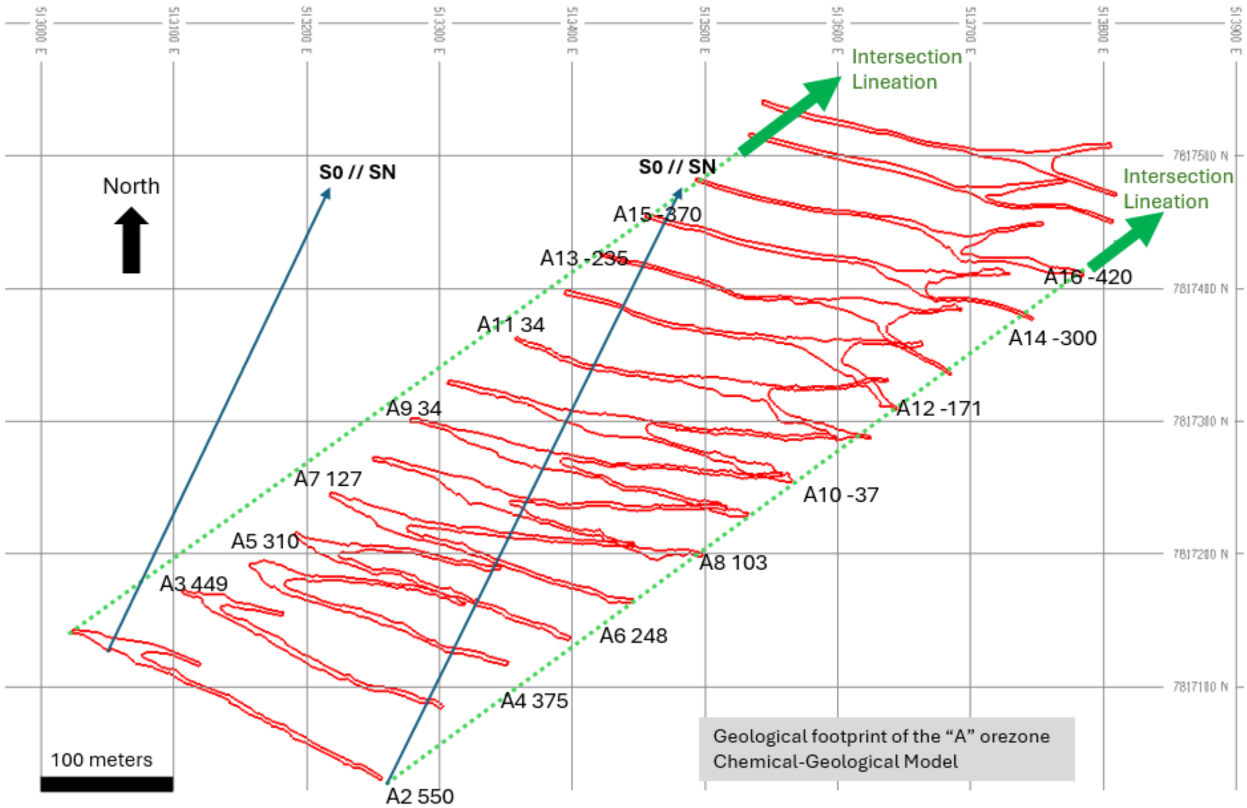
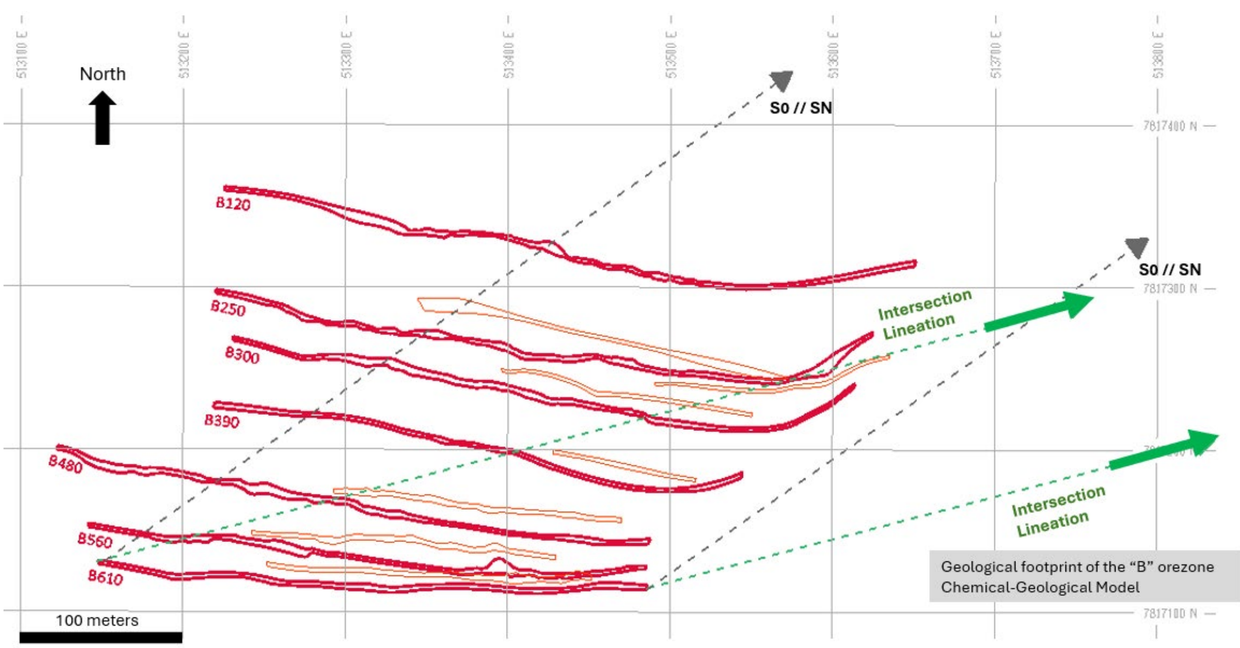


Figure 7-5: Plan View of the Structural Features of Orebody B



7.3 Local Geology

7.3.1 Turmalina Mine

7.3.1.1 Stratigraphic Setting

The Pitangui area, where the MTL Complex is located, is underlain by rocks of Archaean and Neoproterozoic ages. Archaean-aged units include an older granitic basement (the Divinópolous Complex), which is overlain the Pitangui Group. These are intruded by four younger Archean-aged granitic bodies. One of these younger intrusions, the Casquilho Pluton, is located immediately along strike to the southeast of Orebodies A, B, and C. It appears to post-date most of the gold mineralization contained within those deposits, and its northwestern contact has been traced by drilling to depths of approximately 1,300 m from surface. The eastern contact of this intrusion is interpreted to be located beyond the eastern limits of Jaguar's Turmalina mineral claims.

The Pitangui Group is defined as a greenstone-belt sequence, of Archean age. It shows the following stratigraphic sequence (from the base to the top):

- Meta-Ultramafic and Meta-Mafic Volcanic Unit (Basal Unit): constituted by interlayered igneous ultramafic and mafic flows represented by serpentinites, chlorite-actinolite schists and amphibolites with layers of talc schists, oxide-facies BIFs and carbonaceous phyllites
- Meta-Mafic and Meta-Sedimentary Unit (Middle Unit): constituted by interlayered meta-mafic rocks (chlorite-actinolite schists with dacitic intrusions at the top)
- Meta-Sedimentary: cummingtonite BIFs and meta-chert rich horizons interlayered with carbonaceous and chlorite schists. Locally, layers of meta-arkoses can be observed.
- Meta-Mafic: alternation of layers of amphibolite and chlorite-actinolites
- Pyroclastic and Meta-Pelites: volcanic meta-conglomerates at the base, transitioning to, or alternating with, foliated meta-lapilli tuffs and meta-tuffs at the top of the sequence, where the meta-tuffs become predominant
- Meta-Sedimentary Unit (Upper Unit): narrow and numerous interlayered layers of quartz-sericite schists, quartz-chlorite schists, quartz-sericite-chlorite schists, and carbonate-rich schists

The basal unit of the Pitangui Group is comprised of a base of mafic metavolcanic rocks which is overlain by a carbonaceous schist unit and units of banded iron formations and meta-cherts. The Água Sija-Casquilho unit is comprised from base to top of a quartz-sericite schist, a biotite-quartz schist, a metalapilli tuff, intermediate metavolcanic flows, and a quartz-chlorite-sericite schist. The Pitangui unit is comprised largely of intercalations of metagreywacke and phyllite.

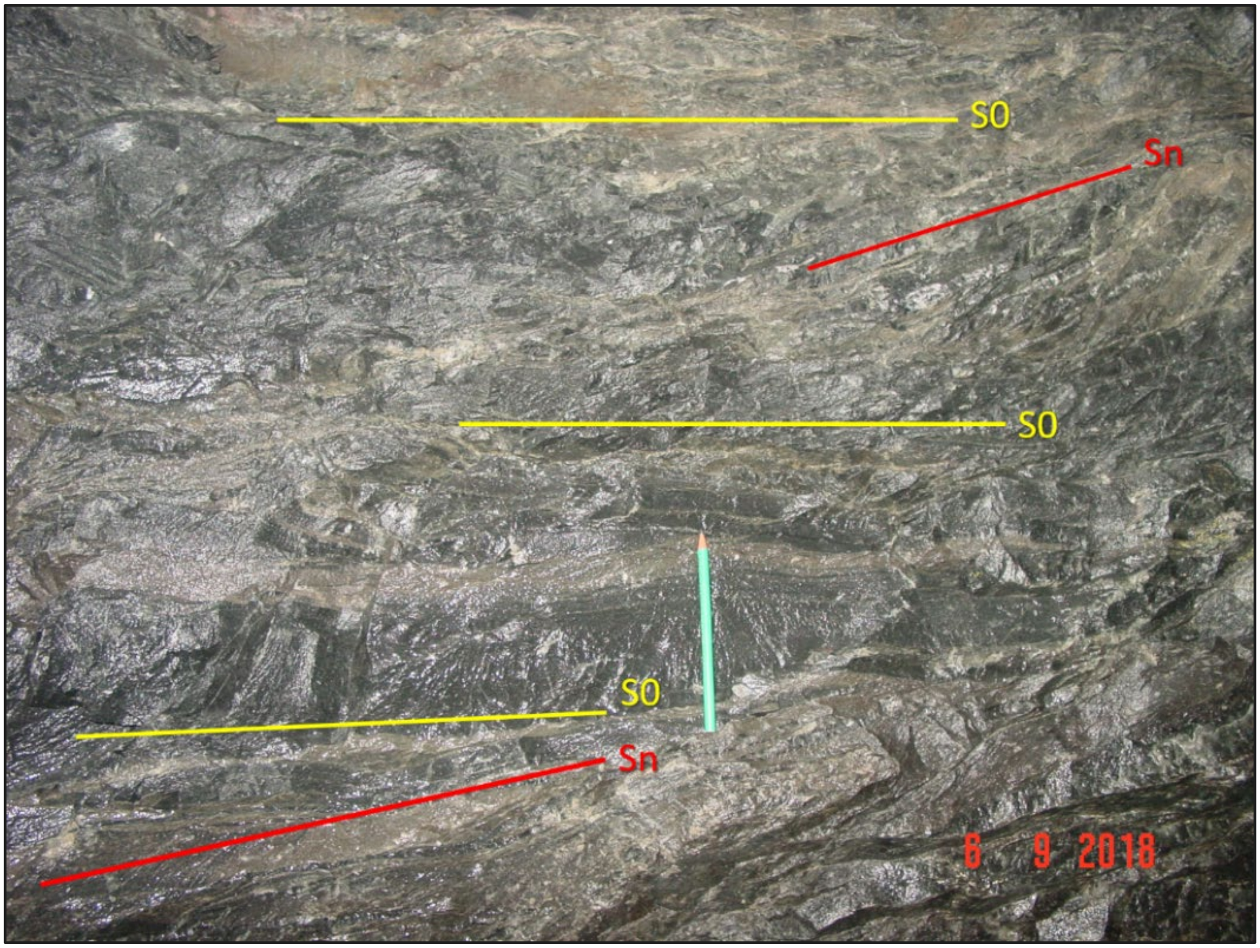
The mineral deposits at Turmalina are hosted by chlorite-amphibole schists and silicified biotite schist units of the Água Sija-Casquilho unit. All stratigraphic units in the mine area broadly strike in a general northwesterly-southeasterly direction and dip steeply to the northeast. Information collected from various geological mapping programs suggest the presence of at least four thrust faults in the mine area stratigraphy. For the most part, these faults strike approximately parallel to the stratigraphic units and are interpreted to dip steeply to the northeast. A number of post-mineralization, brittle cross faults are interpreted to be present in the mine area that generally strike in a northeasterly direction. Their dips are not well understood at present, but are suspected to be sub-vertical.

7.3.1.2 Structural Geology

The mineralized zones at Turmalina Mine are hosted by a variety of schistose, silicified, sulphide-rich lithological units which are interpreted to have been penetratively deformed by two distinct, successive tectonic events (the Dn and the Dn+1 events). The Dn deformation event is mainly recorded by a conspicuous penetrative tectonic cleavage (Sn), and also by a somewhat subtle, but highly important, intersection lineation that can be seen in both of their forming planes - the bedding (S_0) surfaces and the Sn cleavage planes. The Sn cleavage, a petrofabric that records a moderate-to-high intensity compressional regional tectonic event, is generally observed as sub-parallel to oblique surfaces to the bedding plane. The Dn+1 deformation event is interpreted to be a mild regional tectonic event in the immediate surroundings of the Complex. The presence of this later event is mainly recognized by pervasive micro-crenulations overprinting the Sn cleavage planes, by the local development of crenulation cleavage planes in more incompetent (phyllosilicate-rich) lithologies, and by the localized presence of kink-style, largely gentle folds with variable amplitude and scale.

The bedding (S_0) surfaces of the mine package consistently strike at 315° and dip -50° to -60° towards an azimuth of 45°. The consistent average strike orientation of the Sn cleavage is 290° to 300°, with a dip of approximately -60° to -65° towards an azimuth of 20° to 30°. The highly important intersection lineation plunges approximately -45° to -50° towards an azimuth of 65° to 75°. As a direct result of the above-mentioned recent mapping activities underground, it is now postulated that the down-plunge continuity of the stratabound, tabular economic bodies of the Turmalina deposit mimics, in terms of geographic orientation, the attitude of the intersection lineation, which has been identified and statistically measured underground (intersection lines between bedding planes/S_0 and the main penetrative tectonic cleavage/Sn). This interpreted spatial “linear control” would also correspond to the orientation of axes of hypothetical (plunging and overturned) major amplitude Dn/Fn overturned folds that deformed regional stratigraphic packages of the Pitangui greenstone belt. Figure 7-6 provides an example of some of the structural features that are observable within underground exposures in Orebody C. This exposure shows two penetrative planar structural petrofabrics Sn and S_0.

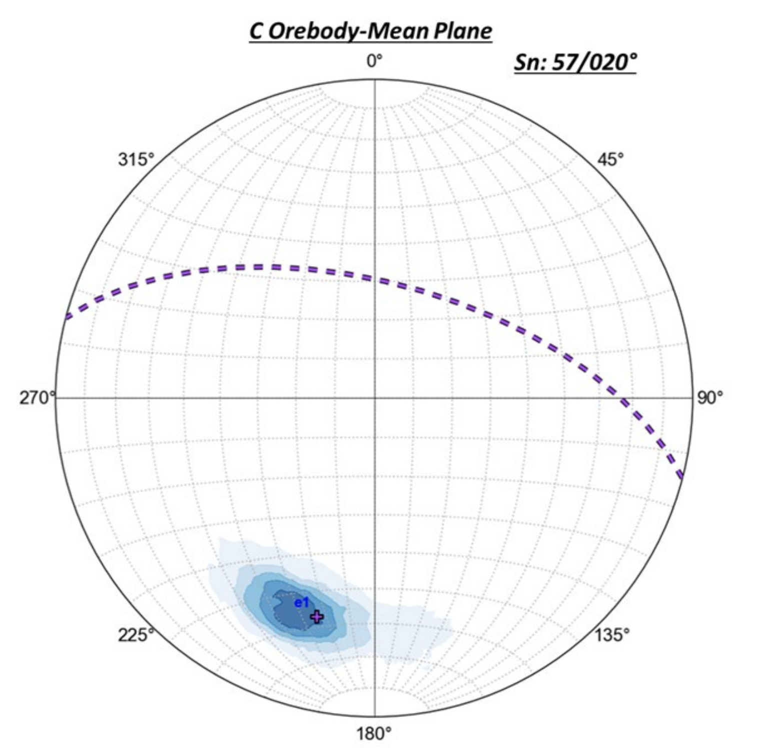
Figure 7-6 Example of Two Penetrative Planar Structural Petrofabrics in a Single Underground Exposure of BIFs in Orebody C

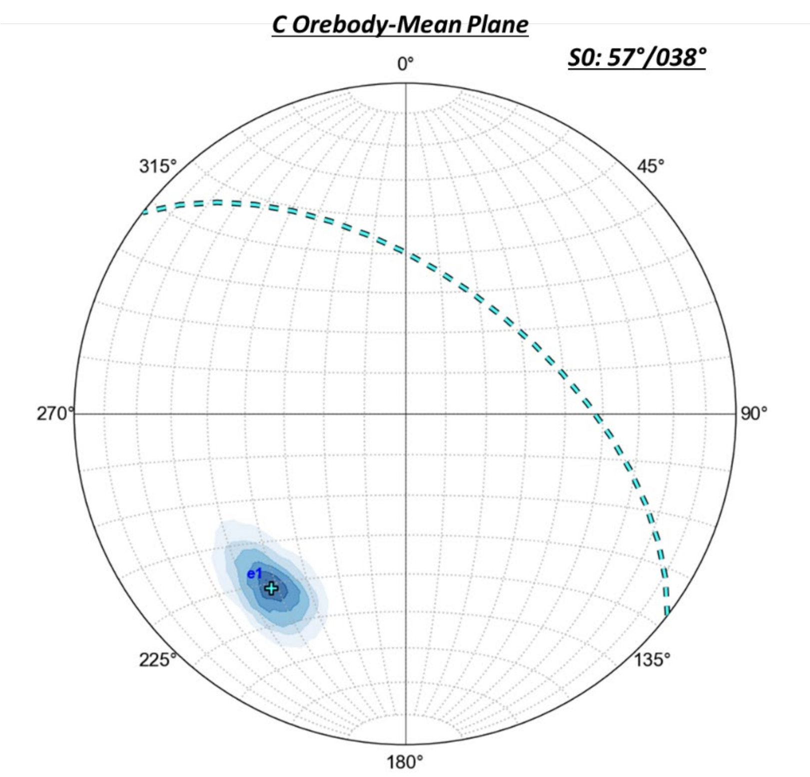


Notes: S0: bedding; Sn: main tectonic cleavage.

Figure 7-7 presents a sample stereonet showing the statistical attitude of the intersection lineations measured underground (intersection lines between the bedding planes/S_0 and the main penetrative tectonic cleavage/Sn) at a single operational level. This highly important penetrative lineation plunges approximately -45° to -50° towards an azimuth of 65° to 75° at the Turmalina Mine.

Figure 7-7: Sample Structural Stereonet





7.3.1.3 Mineralization

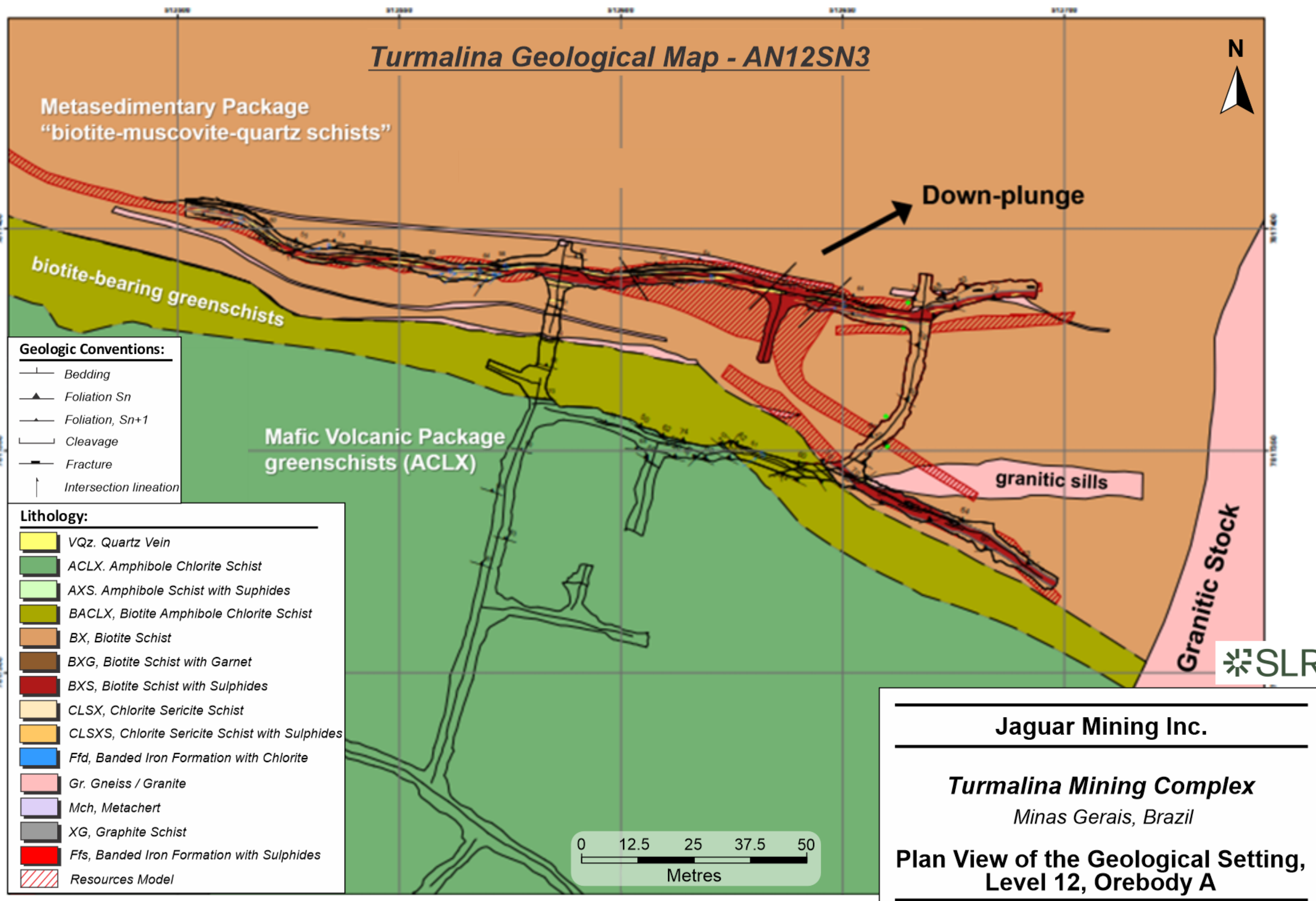
The mineralization at the Turmalina Mine consists of a number of stratiform, tabular bodies that are spatially related to either a BIF package or to a package of slightly silicified quartz-muscovite-biotite schists. These tabular bodies are grouped together, according to the host stratigraphy, to the spatial configuration and to the gold content, into Orebodies A, B, and C (together the Orebodies). Gold can occur within the BIF package, but can equally occur in the other host lithologies. The down-plunge continuity of mineralization within the Orebodies follows the intersection between bedding planes/S_0 and the main penetrative tectonic cleavage/Sn and the attitude of this intersection lineation has been identified and statistically measured underground.

Much of the past gold production of the mine has been derived from Orebody A (Figure 7-8), which is mostly comprised of slightly silicified and “veined” quartz-muscovite-biotite schist host rocks (swarms of small, prevalent, quartz veinlets that are centimetres in width). The economic mineralization in this zone has been outlined along a strike length of approximately 550 m to 600 m (with an average thickness of 6 m) and to depths of approximately 1,300 m to 1,400 m below surface. The southeastern portion of Orebody A is composed of two parallel narrow veins. The northwestern portion of Orebody A is much the same as the southeastern, however, the two parallel zones nearly or completely merge and therefore the economic zone is much wider overall to the northwest direction (locally up to 10 m to 15 m in thickness). Orebody A is mostly comprised of slightly silicified (with swarms of thin quartz veinlets) biotite-muscovite-quartz schist host rocks (a metasedimentary package). Mining activities on Orebody A were put on hold in late 2022.

Orebody B is located in the structural hanging wall of the Orebody A, and is geologically somewhat similar to Orebody A, both in terms of the type of the host package and of the visual style of the gold mineralization. The Orebody B comprises to two or three lower grade, tabular-shaped lenses that are oriented generally parallel to Orebody A. These lenses are located approximately 50 m to 75 m in the structural hanging wall and are accessed by a series of crosscuts that are driven from Orebody A in the upper levels of the mine. The mineralization in this zone has been outlined along a strike length of approximately 425 m to 475 m and to depths of 950 m to 1000 m below surface.

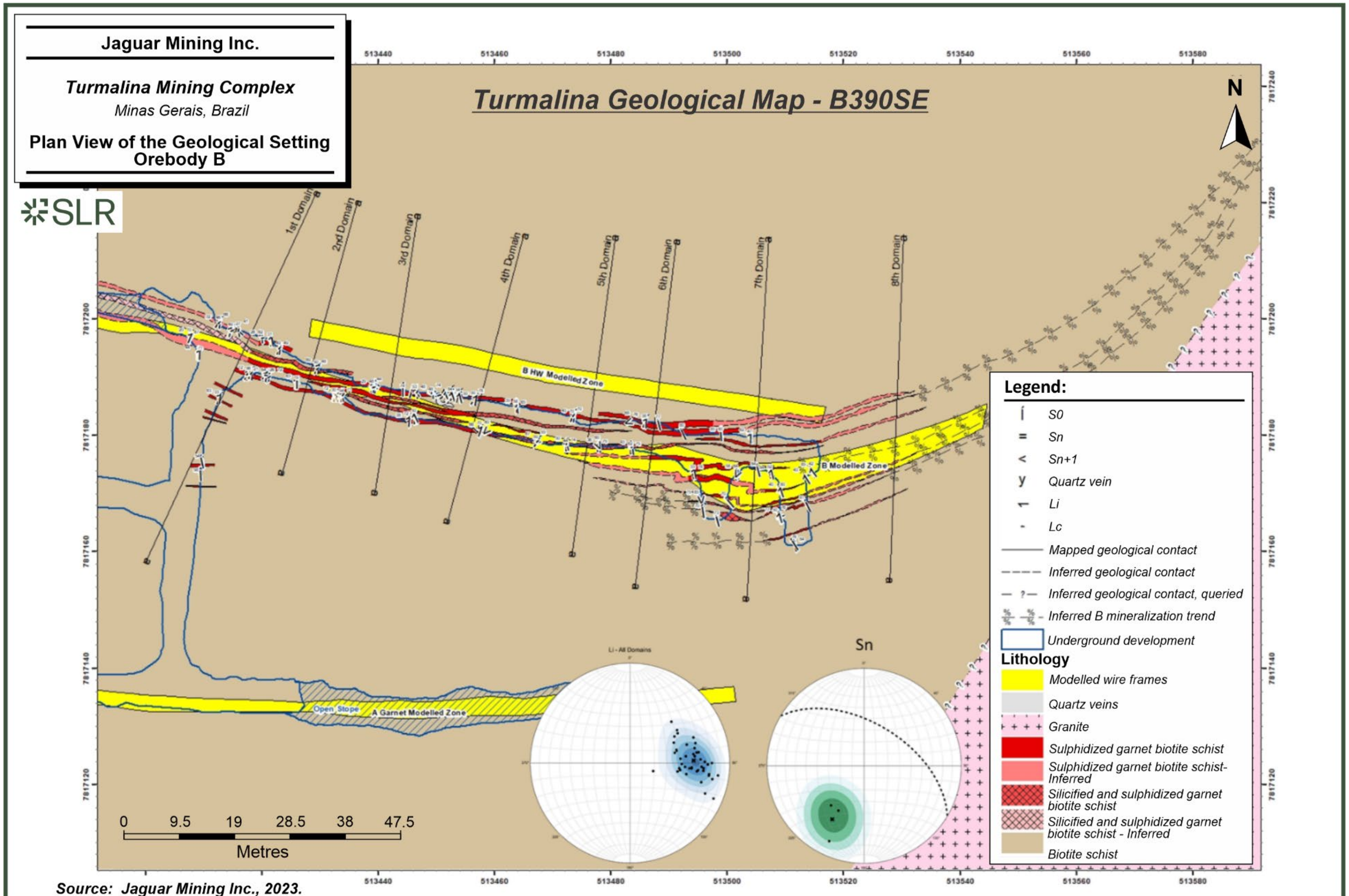
Orebody C is the current primary source of gold production at the Turmalina Mine. It is a mineralized structure located to the southwest, in the structural footwall of Orebody A. At least three individual economic zones (Orebodies CSE, C Central, and CNW) have been delineated in this zone along a strike length of approximately 1,000 m to 1,100 m and to depths of 850 m to 950 m below the surface. The three individual stratiform economic orebodies are generally represented by 2 m to 10 m thick, pervasively altered/silicified/replaced lenses hosted by the unique Orebody C Iron Formation horizon (Figure 7-10). Its auriferous silicification is quite distinctive, being dark gray in colour and sulphide bearing (pyrite, pyrrhotite, and arsenopyrite constituting up to 5% to 12% in volume of the host rocks, Figure 7-11), and characteristically causes a marked obliteration of the original bedding lamination of the iron formations. The silicification zones are stratiform in relation to the host iron-formation layer. It is observed that the high grade economic zones are generally confined to the silicification zones.

Figure 7-8: Plan View of the Geological Setting, Level 12, Orebody A



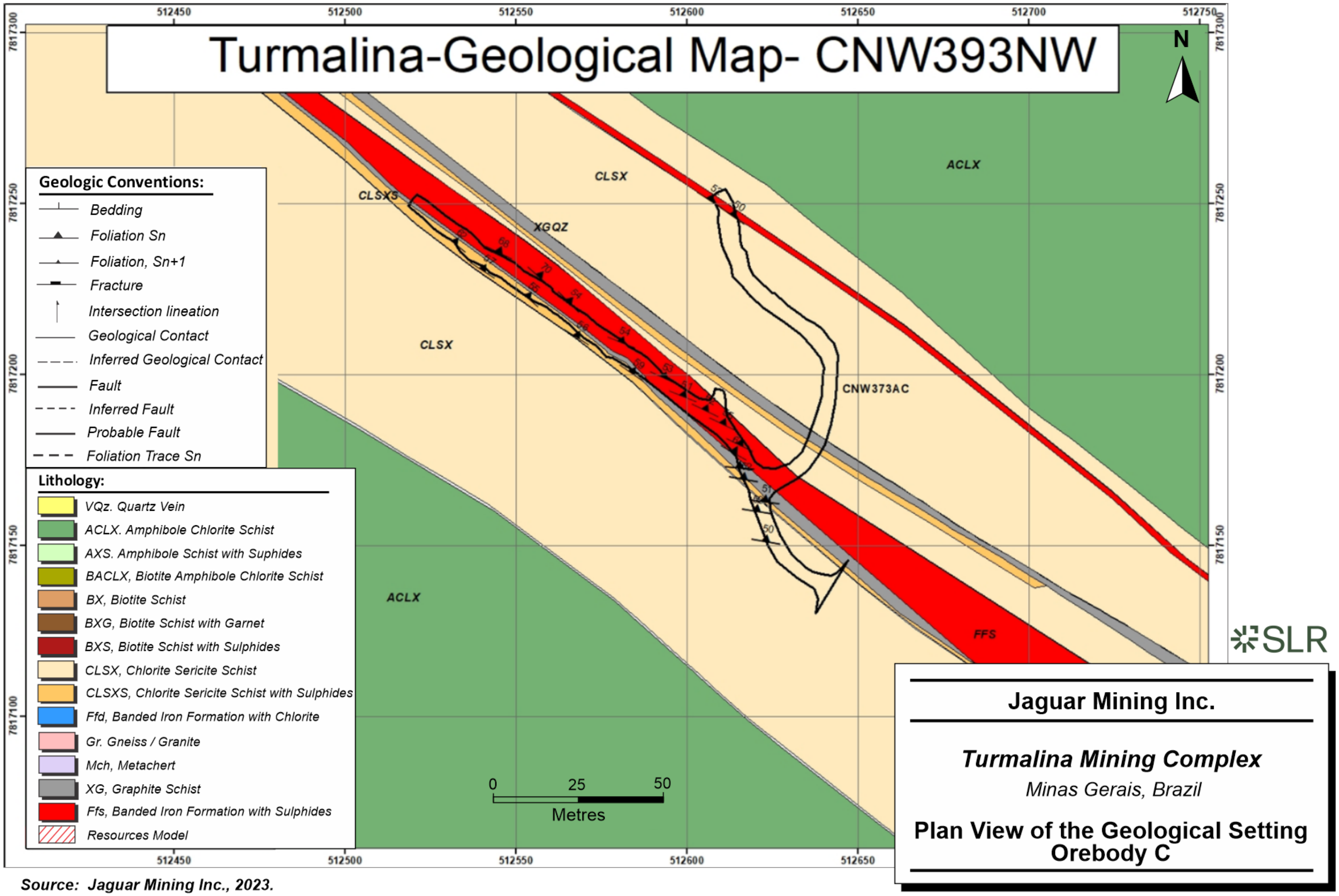
Source: Jaguar Mining Inc., 2023.

Figure 7-9: Plan View of the Geological Setting, Orebody B



Source: Jaguar Mining Inc., 2023.

Figure 7-10: Plan View of the Geological Setting, Orebody C



Source: Jaguar Mining Inc., 2023.

Figure 7-11: View of Orebody C in Underground Exposure

The quality of the average gold grades of the mineralized zones of Orebodies A, B, and C is a direct function of the relative amount of arsenopyrite that is present in the total modal concentration of disseminated sulphides present in altered/silicified rock specimens.

Two mineralized lenses are located between the Orebody A and the previously known lenses comprising Orebody C. These new lenses were discovered as a result of exploration drilling that was carried out from the underground drill bays in 2020 to define and evaluate the lower portions of the Orebody CSE mineralized lenses. The presence of potentially economic mineralization therefore is, very likely, not restricted to only the previously defined mineralized horizons and ore zones. The possibility of additional mineralized zones being located elsewhere in the mine stratigraphy must be considered and evaluated as exploration targets.

Gold mineralization in the Turmalina orebodies occurs as very fine gold grains associated with sulphides in sheared/foliated and silicified schists and BIF sequences. Gold particles average 10 µm to 20 µm in size, and are mostly associated with arsenopyrite, quartz, and micas (sericite and biotite) as presented in Table 7-1. Coarse grained gold, on a millimetre scale, is found locally with discrete quartz veins, but this type of occurrence is minor at the Turmalina deposit.

Table 7-1: Summary of Gold Mode of Occurrence

Associated with:	% of Gold Content	Notes
Arsenopyrite	61	Occurring both inside and at the borders of the mineral
Quartz	26	Occurring both inside and at the borders of the mineral

Associated with:	% of Gold Content	Notes
Micas	9	Occurring both inside and at the borders of the mineral
Pyrite + Pyrrhotite	4	Occurring only at the borders of the mineral

7.3.2 Faina Deposit

7.3.2.1 Stratigraphic Setting

Within the Faina deposit area, the general lithostratigraphic column of the mine package has been defined by Jaguar's geological team as follows (from the base to the top, however not necessarily in an upright stratigraphic sequence):

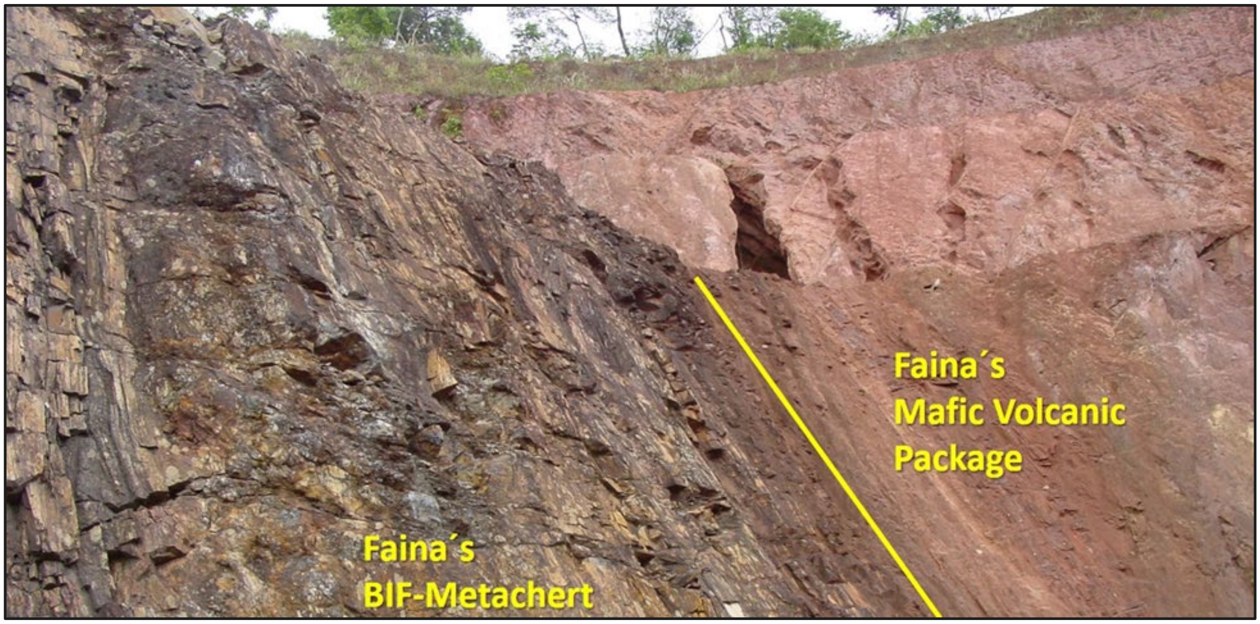
<u>Basal Carbonaceous Phyllite Package:</u> The Faina deposit mineralized package starts with a basal package of very dark-colored, carbonaceous chlorite-sericite-quartz phyllites. These rocks are barren in terms of economic grades for gold. Figure 7-12 presents an image of the Basal Carbonaceous Phyllite package located in the Faina open pit.

Figure 7-12 View of the Basal Carbonaceous Phyllite Package, Faina Deposit

<u>"BIF-Metachert" Horizon:</u> The Carbonaceous Phyllite package is overlain by a horizon of bedded, siliceous "chertic" rocks with local total thicknesses of up to 10 m to 12 m (Figure 7-13). Lithologically, this horizon corresponds to a rhythmically bedded "volcano-chemical" unit containing alternating siliceous/chertic beds and carbonate-silicate beds (ankerite, chlorite, amphiboles).

Mafic Metavolcanic Unit: This is the stratigraphic package that hosts the economic mineralized bodies of the Faina deposit. The Mafic Metavolcanic Unit is composed of amphibolites and amphibole greenschists.

Figure 7-13 View of the BIF-Metachert and Mafic Volcanic Packages, Faina Deposit



7.3.2.2 Structural Geology

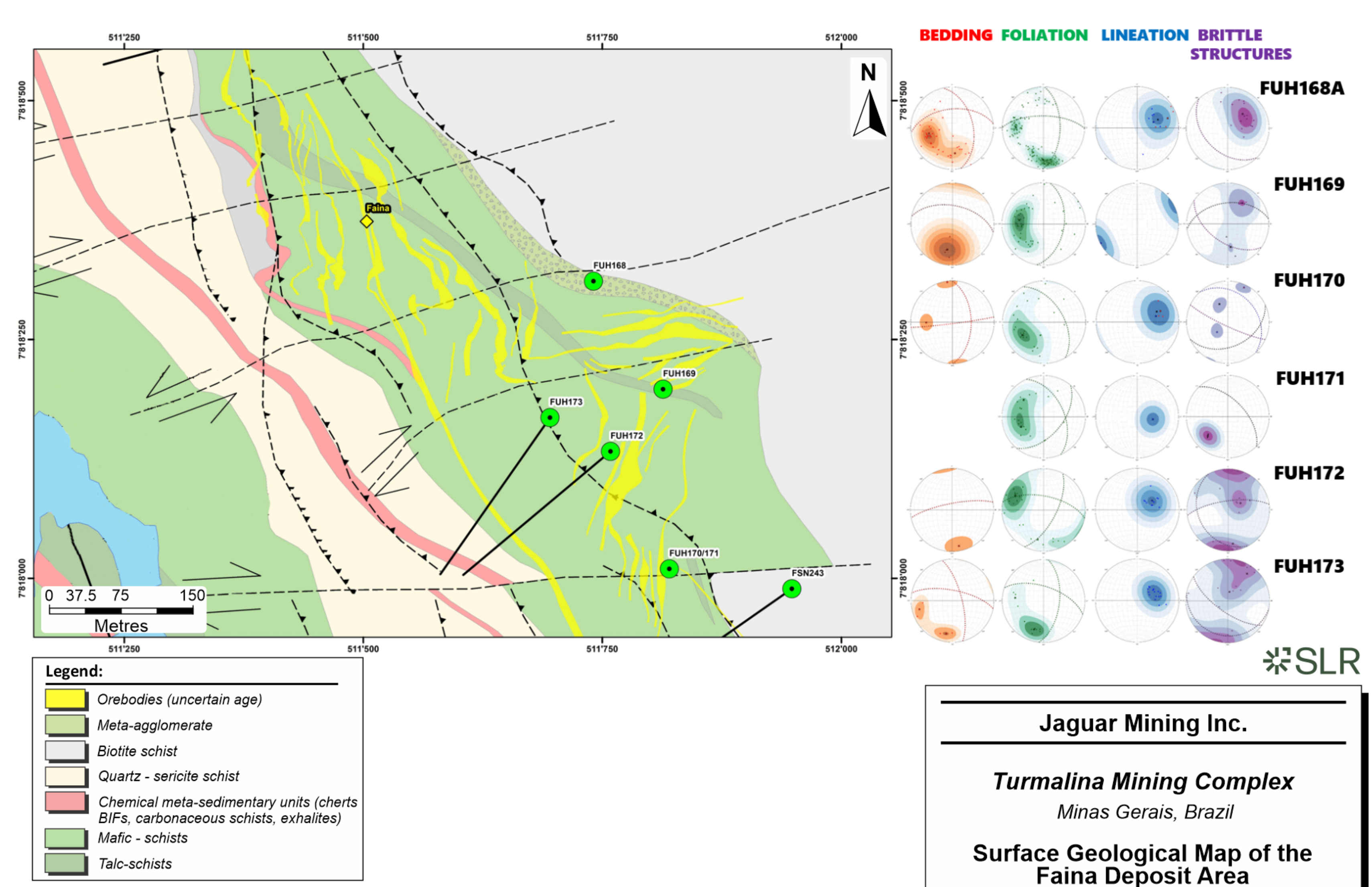
The Faina mineralization and mineralized zones hosted by the Mafic Metavolcanic Unit is inferred to be related, in a larger scale, to a regional, northwest-southeast oriented, transpressional faulting event that also generated a coeval smaller-scale system of east-northeast–west-southwest accommodation, transcurrent-movement faults.

Bedding surfaces of rocks of the Basal Carbonaceous Phyllite Package and of the BIF-Metachert Horizon are easily recorded both in open pit exposures and in drill cores (with the use of the IQ-logger technique). Conversely, bedding surfaces have rarely been confidently observed in amphibolites and greenschists of the Mafic Metavolcanic Unit. The study of the trajectories of the bedding surfaces for the entire length of the Faina open pit (and its immediate extensions) indicates the framework and geometry of a relatively open, deposit-scale fold with its two limbs dipping (i) 50° towards an azimuth of 74° and, (ii) 57° towards an azimuth of 6°. The fold axis attitude has been inferred to be a plunge of 45° towards an azimuth of 53°.

The main penetrative tectonic foliation mapped in amphibolites and amphibole greenschists of the Mafic Metavolcanic Unit (the Sn cleavage) has also been folded. The mean attitudes/dips of these tectonic planar surfaces (maximums) are: (i) 54° towards an azimuth of 94° and, (ii) 56° towards an azimuth of 24° (therefore, close to parallel to the orientation of the bedding surfaces recorded in bedded rocks of the Basal Carbonaceous Phyllite Package and of the BIF-Metachert Horizon). The inferred attitude for the axis of the folded Sn surfaces mapped along entire length of the Faina open pit (and its immediate extensions) is around 49° towards an azimuth of 70°.

Figure 7-14 shows a geological map of the Faina deposit area, indicating the presence of a larger-scale, northwest-southeast oriented, transpressional compressional fault event that appears to have generated a coeval smaller-scale system of east-northeast–west-southwest-oriented accommodation, transcurrent-movement faults. The outline of the previously modelled individual economic mineralized zones, as shown in yellow in Figure 7-14, had already indicated the existence of a relative open, high-amplitude fold for the Faina mine package. Such a fold would have one limb dipping towards the east-northeast, and the other one dipping approximately towards the north. A synthesis of the structural readings collected in drill cores (with the use of the IQ-logger technique) during the more recent 2020 and 2021 Faina drilling campaign is presented in Figure 7-14. In this figure, mapped ore bodies are presented in yellow, and the locations of the holes used for the IQ-logger are shown in light green with black dots in the middle. Holes FUH173, FUH172, and FSN243 were drilled to the southwest, and their drill hole traces are shown in black.

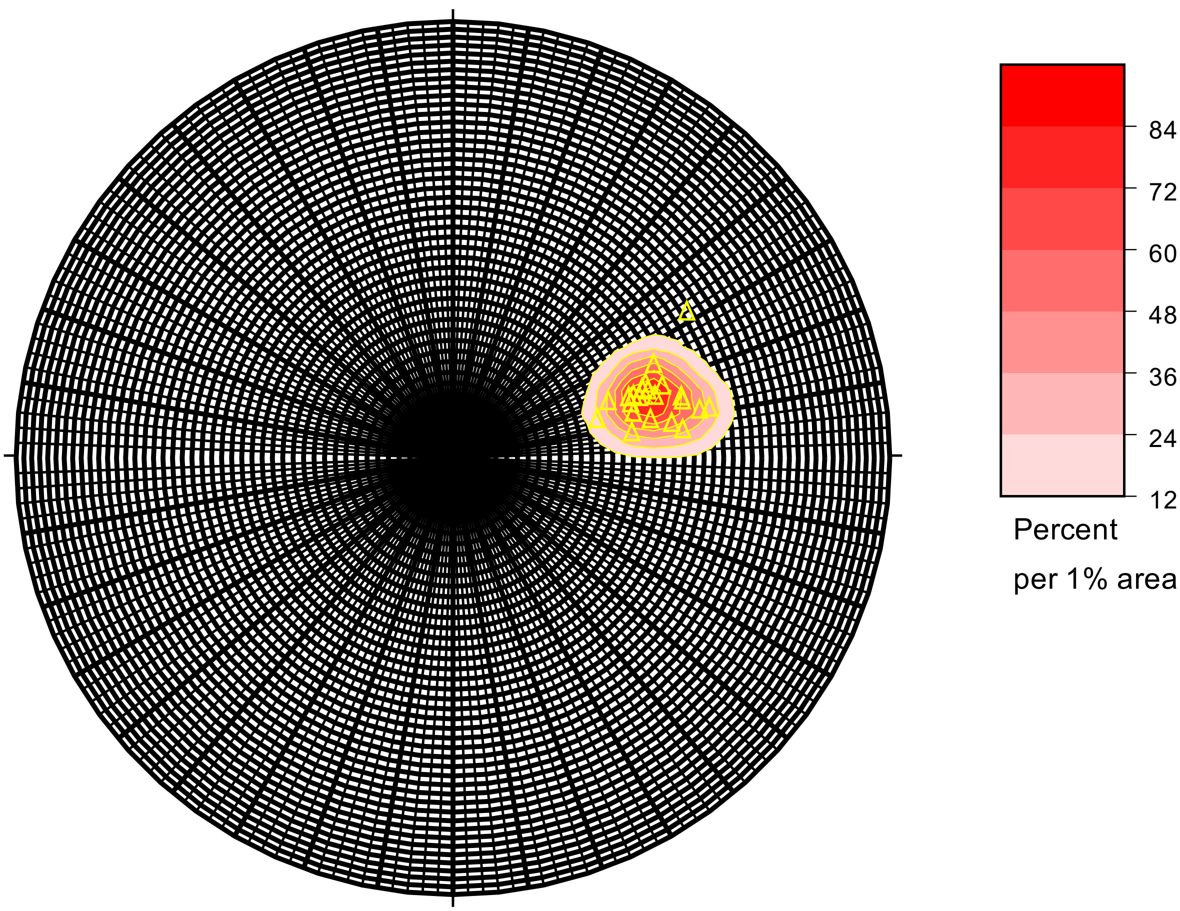
Figure 7-14: Surface Geological Map of the Faina Deposit Area



Source: *Jaguar, 2023.*

The structural stereonet presented in Figure 7-15 shows the statistical distribution of the penetrative intersection lineation related to the Dn/Sn deformation event, mapped in rock packages of the Faina open pit. This penetrative lineation, of great exploration importance, corresponds to the intersecting lines between bedding planes/S_0 and the main penetrative tectonic cleavage/Sn. Moreover, extensive field exploration and mapping activities completed in the region in the past (by Unigeo/AngloGold and by Jaguar) have clearly demonstrated that this intersection lineation mimics, in terms of orientation, the average orientation of the down-plunge continuity of the mineralized zones and Turmalina Orebodies A, B, and C.

Figure 7-15: Structural Stereonet, Faina Deposit



7.3.2.3 Mineralization

The auriferous gold mineralization at the Faina deposit corresponds mainly to swarms of sulphide bearing quartz veinlets (individual veinlets with millimetric-to-centimetric widths) which are hosted by amphibolitic packages of the Mafic Volcanic Unit. The mineralized swarms of quartz veinlets appear to occur within conformable horizons to the mine stratigraphic package, in at least several distinct “stratigraphic layers” of the Mafic Volcanic Unit. Moreover, the mineralized quartz veinlets have locally been mesoscopically folded, in the same manner as the bedding/S0 surfaces and the Sn cleavage planes locally were folded. The mineralized quartz veinlets and the pervasive silicification hosted by amphibolitic packages at Faina are accompanied by disseminated sulphides (pyrite, arsenopyrite, pyrrhotite, and berthierite ($FeSb_2S_4$)), however, these accessory mineral phases rarely exceed 5% of the mineralized/economic rock volume.

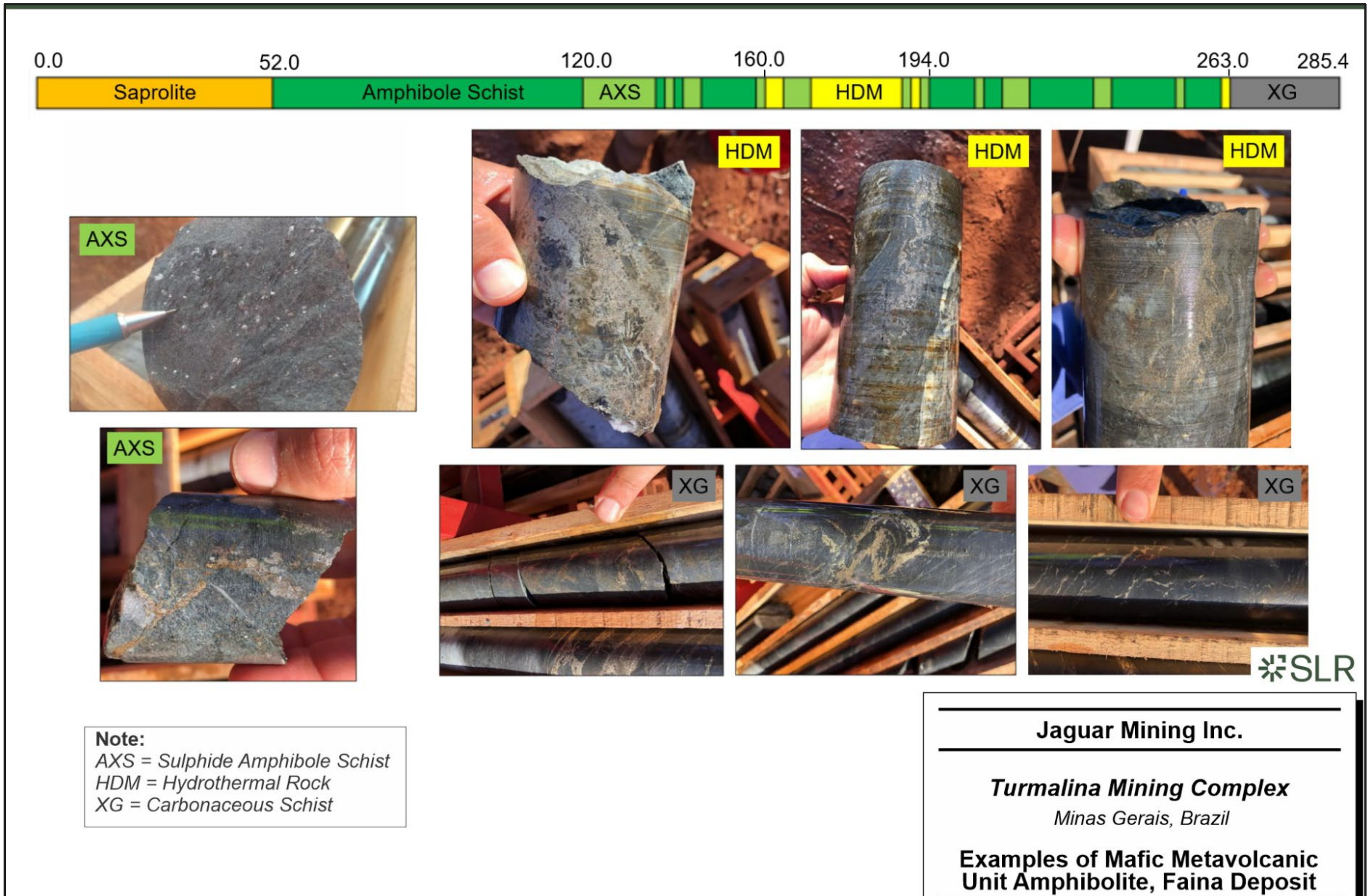
The past open pit operation indicated that the individual folded economic zones and lenses of the Faina deposit have dimensions of 20 m to 140 m along the S0//Sn strike, 1 m to 15 m in thickness, and very reliable continuities down-plunge, noting the maximum attitude of -50° towards an azimuth of 73° for the intersection lineations inside the Faina open pit.

The economic mineralization at the Faina deposit is continuous down-plunge from surface for at least 850 m in length, as verified by the results of the deepest available drill hole, FUH-220, that intercepted the economic mineralized zone between 550 m and 650 m below the surface.

presents examples of the distinct visual styles of/for the gold mineralization that can be recognized in a single diamond drill hole targeting the Faina mine package (e.g., hole FUH-168A). “HDM” has been, since 2020, the field lithologic name for the high grade Faina mineralization/veining/alteration that is hosted by hydrothermally altered intervals. At the same time, “AXS” has been the field name for a weaker, non-economic manifestation of the Faina mineralization/alteration environment overprinting the amphibolites and amphibole schists of the Mafic Volcanic Unit.

Figure 7-16 presents examples of the distinct visual styles of/for the gold mineralization that can be recognized in a single diamond drill hole targeting the Faina mine package (e.g., hole FUH-168A). “HDM” has been, since 2020, the field lithologic name for the high grade Faina mineralization/veining/alteration that is hosted by hydrothermally altered intervals. At the same time, “AXS” has been the field name for a weaker, non-economic manifestation of the Faina mineralization/alteration environment overprinting the amphibolites and amphibole schists of the Mafic Volcanic Unit.

Figure 7-16 Examples of Styles of Gold Mineralization at the Faina Deposit



Source: Jaguar, 2023.

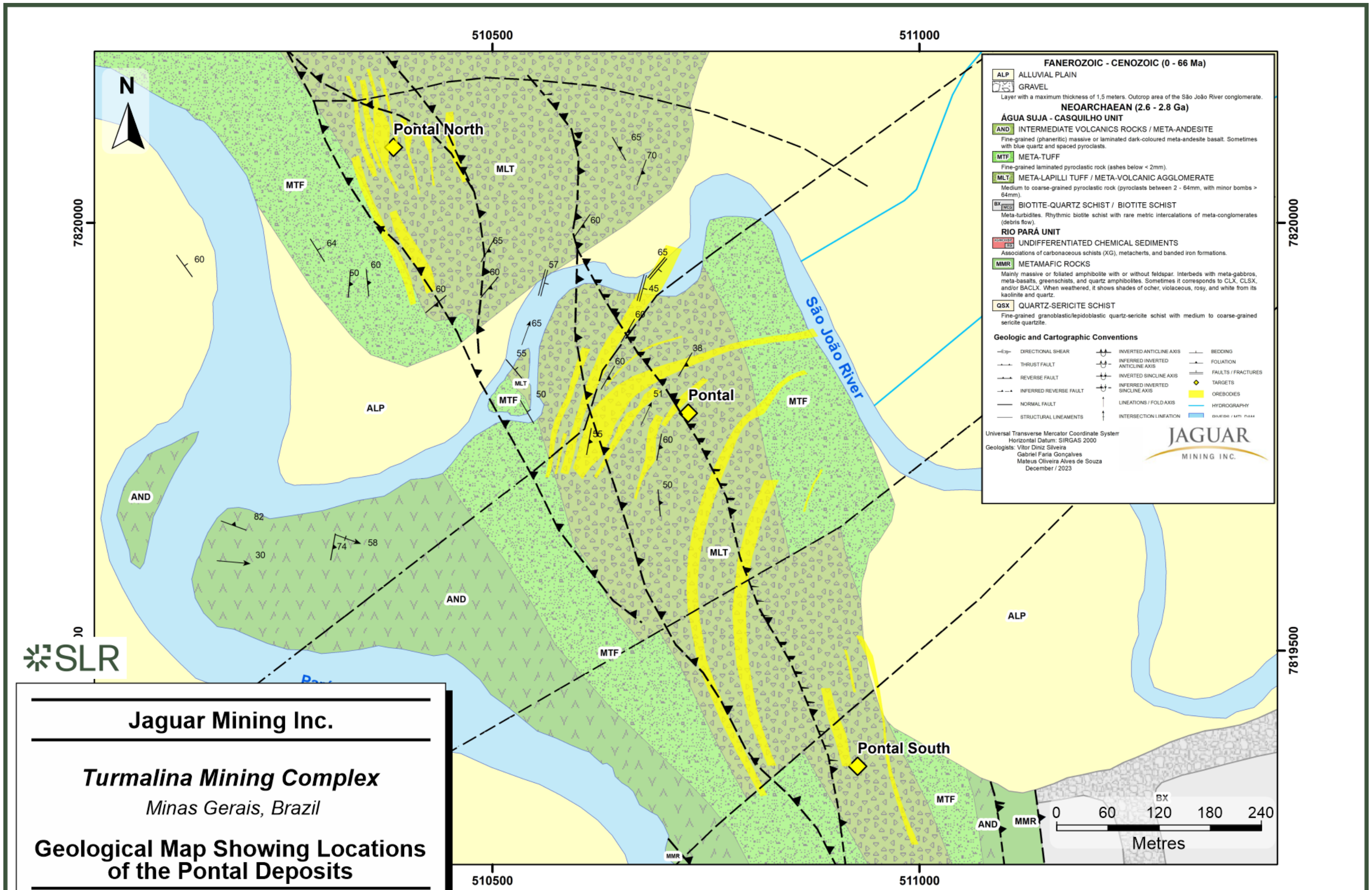
7.3.3 Pontal Deposits

The targeted Pontal stratigraphic package in the Pitangui greenstone belt is mainly composed of quite unique felsic meta-tuffs, meta-agglomerates, and metamorphosed "chaotically-redeposited conglomeratic" felsic or intermediate volcanic packages. This package gradually changes laterally and vertically into the more usual lithologies of the Pitangui greenstone belt (the more common mafic volcanic amphibolites and meta-andesitic sequences).

The apparently stratabound main mineralized horizon at the Pontal deposits has up to 50 m to 60 m in true thickness, and has been confirmed by drilling to continue to depths on the order of 250 m from surface (e.g., hole PTL-85, which intercepted the mineralized zone between 204.2 m and 238.2 m below the surface). Drilling information and more recent fieldwork suggest that the down-plunge continuity of these somewhat laterally discontinuous mineralized lenses is along the orientation of an azimuth of 70°, thus, mimicking in attitude both the local and semi-regional orientation of the penetrative intersection lineations and of the average down-plunge orientation of the well-known economic zones at the Turmalina Mine. It has been estimated that strike length for each individual lens may be several hundred meters.

Figure 7-17 shows locations of the newly discovered Pontal South target in relation to the previously delineated Pontal and Pontal North targets.

Figure 7-17 Geological Map Showing Locations of the Pontal Deposits



Source: Jaguar, 2023.

7.3.3.1 Stratigraphic Setting

Jaguar´s exploration team stratigraphically correlates the targeted Pontal mineralized horizon to part of the "Água Suja – Casquilho" geological unit. This unit is composed mainly of stratovolcano packages, oligomictic and polymictic pyroclastic flows, chaotic, explosive-type volcanogenic depositions, and also shows the very localized presence of narrow horizons or bodies of volcanogenic-looking massive sulphides. The frequent presence of individual glassy-textured blue quartz crystals, the conspicuously observed erosion and/or sedimentary-reworked structures within the package, and the presence of agglomerates and immature volcanic conglomerates support the interpretation that the main Pontal deposit is hosted by a unit that records an important pyroclastic and high-energy magmatic event in the Pitangui greenstone belt.

7.3.3.2 Structural Geology

The current interpretation is that the Pontal gold mineralization event is related to a northwest-southeast striking semi-regional shear-fault zone and also to more local northeast-southwest or east-northeast–west-southwest fault zones of sinistral transcurrent nature.

Bedding surfaces are not easily distinguishable in drill cores, primarily due to the pyroclastic and conglomeratic nature of the host stratigraphic package. More tuffaceous horizons of the Pontal package, however, are well-banded, showing visible compositional and granulometric variations. In most areas, an average dip of -50° to -55° towards an azimuth of 50° to 65° is representative of the attitude of the bedding surfaces of the Pontal package (all structural information gathered in drill cores, with the systematic use of the IQ-logger technique). Analysis of penetrative structural petrofabrics from six 2021 drill holes using the IQ-logger technique, assisted with the discovery of the Pontal South mineralized zone.

The main and continuous penetrative tectonic cleavage/schistosity mapped in the Pontal rocks (Sn) dips at an average of -50° towards an azimuth of 100°. More locally, this continuous penetrative schistosity can be crenulated and/or folded by a younger deformation episode. The main linear structures and petrofabrics recorded in drill cores are stretched pyroclasts on Sn planes (average attitude at -51° towards an azimuth of 86°), fold axes (average attitude at -62° towards an azimuth of 106°), intersection lineations (between the bedding and Sn planes), and a younger crenulation lineation on Sn planes.

7.3.3.3 Mineralization

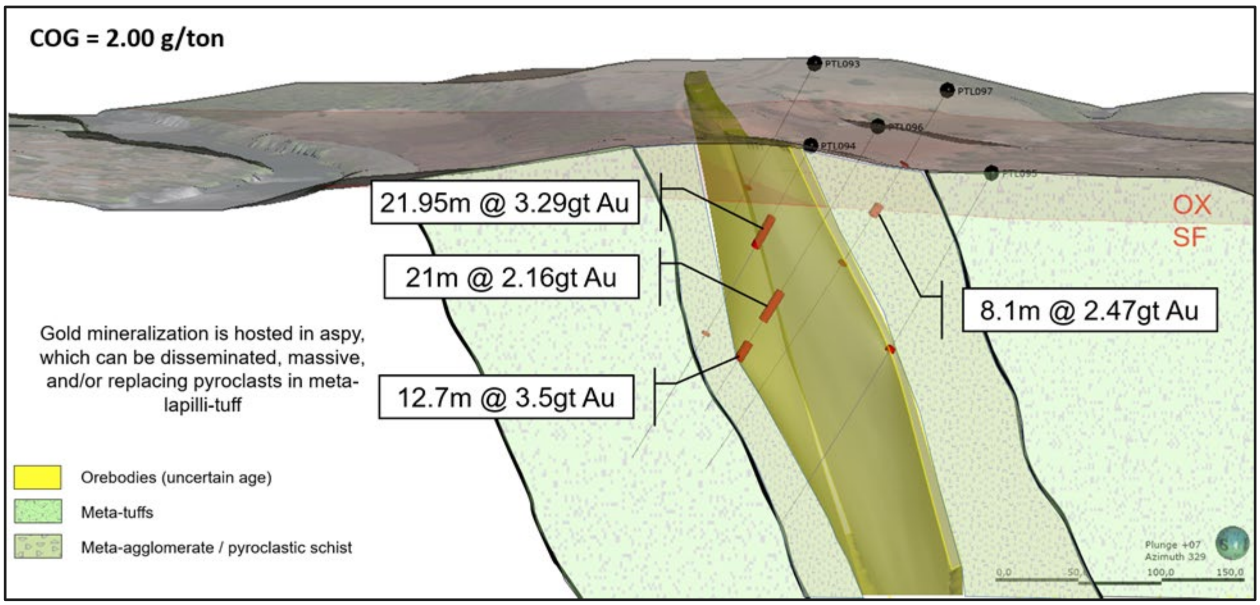
The potentially economic mineralization at the newly discovered Pontal South target corresponds to a prospective stratigraphic horizon that is more than 30 m thick, with a minimum length of 350 m along the strike, and with average composite gold grades at the minimum range of 2.5 g/t to 3.5 g/t delineated to date. In the Pontal area, the exploration team has recently been observing the presence of subordinate quantities of an "exotic" base metal metallic mineral assemblage spatially and genetically related to the economic gold mineralization (e.g., galena, berthierite ($FeSb_2S_4$), stibnite, bornite and covellite, among other metallic mineral phases of difficult identification during the core-logging activities).

Figure 7-18represents a cross section showing the general stratigraphic setting of the Pontal South mineralized zone.

Three slightly different styles of gold mineralization shown in Figure 7-19 have been recorded in the Pontal South target, all are gold-arsenic-antimony-rich. The most common style consists of fine grained disseminations of sulphides composed mostly of arsenopyrite, pyrite, and pyrrhotite contained within the pyroclastic host rocks. The second style is made up of massive concentrations of sulphides (mainly arsenopyrite and antimony sulphides) located principally around quartz veins and within highly (or pervasively) silicified domains of the same pyroclastic host rocks. The last "style" to be considered would be a result of the presence of multiple sulphidized clasts and coarse transported fragments, either primarily mineralized and redeposited, or eventually replaced by the same ore fluids that "sulphidized" the matrix of the pyroclastic host rocks.

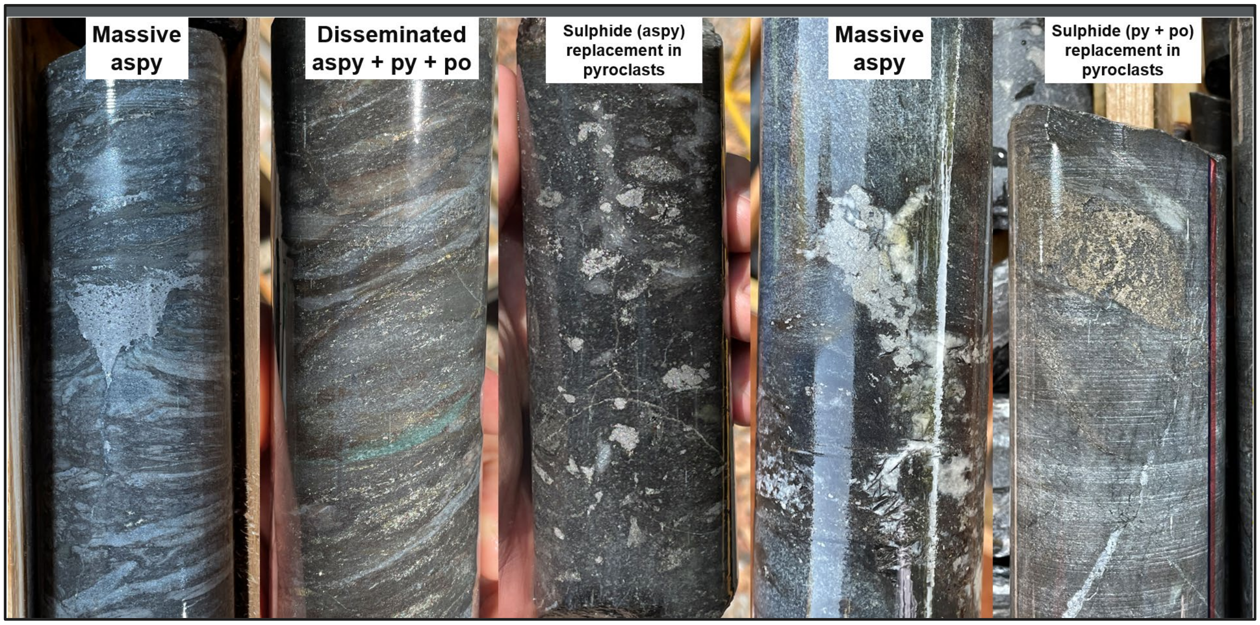
In the Pontal area, the exploration team has recently been observing the presence of subordinate quantities of an "exotic" base metal metallic mineral assemblage spatially and genetically related to the economic gold mineralization (e.g., galena, berthierite ($FeSb_2S_4$), stibnite, bornite and covellite, among other metallic mineral phases of difficult identification during the core-logging activities).

Figure 7-18 Cross Section Showing Stratigraphic Setting – Pontal South Zone



Source: Jaguar, 2023

Figure 7-19: Examples of Sulphidation and Alteration in Drill Core from the Pontal Deposit



Source: Jaguar, 2023

Metallogenically, the lapilli-tuffs and agglomerates of the Pontal mineralized package are loosely interpreted as a more permeable unit capable of receiving and hosting mineralization-forming fluids from the high-profile, semi-regional northwest-southeast shear zone. However, it is also noteworthy that the silicification event, spatially and genetically related to the sulphidation and gold mineralization in the Pontal prospective environment, exhibits quartz veining swarms with visible and persistent crustiform textures (Figure 7-20). Crustiform textures in veins from gold bearing alteration systems very often are strong indications of the existence of shallow-crust conditions and/or epithermal metallogenic environments.

Figure 7-20: Silicification and Sulphidation Associated with Gold Mineralization-Pontal Deposit

Source: Jaguar, 2023

7.3.4 Zona Basal Deposit

7.3.4.1 Stratigraphic Setting

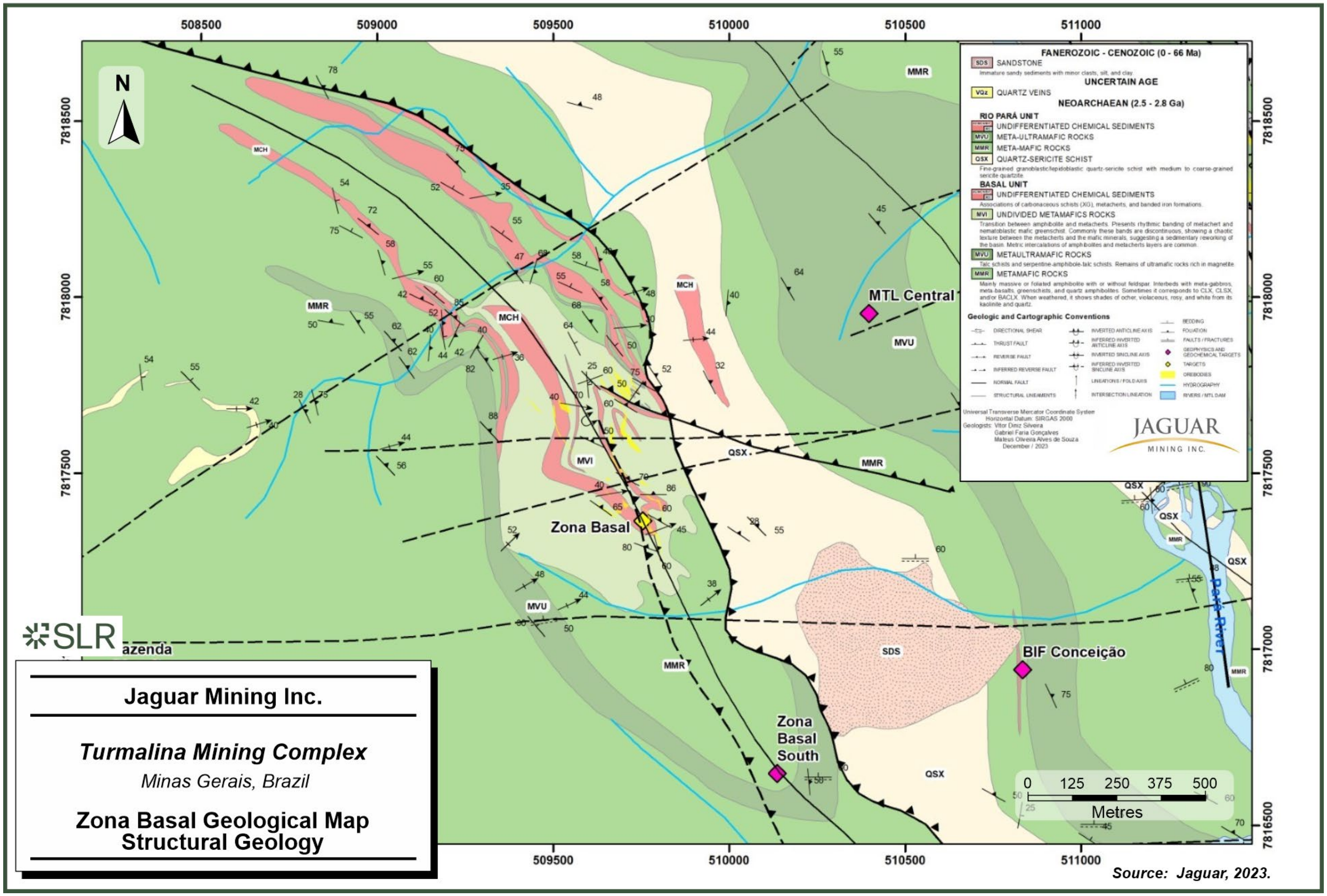
The stratigraphy of Zona Basal can be understood as a general package of amphibolites (whose protoliths were mafic volcanic rocks) interlayered with talc-chlorite schists (ultramafic protoliths) and some undifferentiated meta-mafic volcanic rocks (MVI), with minor horizons of ferruginous metacherts and carbonaceous phyllites towards the top of the sequence.

The "transitional" stratigraphic portion of the Basal Zone, a portion that is mainly characterized by the MVI volcanic rocks in close association with the volcano-sedimentary lithologies (metacherts and carbonaceous phyllites), hosts both the targeted assumed epigenetic gold mineralization and the disseminated and massive manifestations of a volcanogenic sulphidation event also recorded in the target (pyrite, arsenopyrite, pyrrhotite, galena, sphalerite, tungsten, and antimony accessory mineral phases). This exotic "lithology" (MVI) would correspond to a transitional and interlayered zone between amphibolitic rocks (mafic volcanism) and the mineralized cherty-rich horizons (volcano-chemical sedimentary rocks).

The host package of the Zona Basal mineralization appears to delineate an overturned and reclined antiform structure, and good average gold grades would tend to occur more in the major hinge zone of the interpreted structure.

Figure 7-21 presents a geological map of the Zona Basal target area, illustrating the general package of amphibolites (mafic volcanic protolithic rocks) interlayered with talc-magnesium chlorite schists (ultramafic volcanic protolithic rocks) and some undifferentiated meta-mafic volcanic rocks (MVI), and with minor horizons of ferruginous metacherts (BIF) and carbonaceous phyllites towards the top of the sequence. The host package of the Zona Basal mineralization appears to delineate an overturned and reclined antiform structure.

Figure 7-21: Zona Basal Geological Map



Source: Jaguar, 2023.

7.3.4.2 Structural Geology

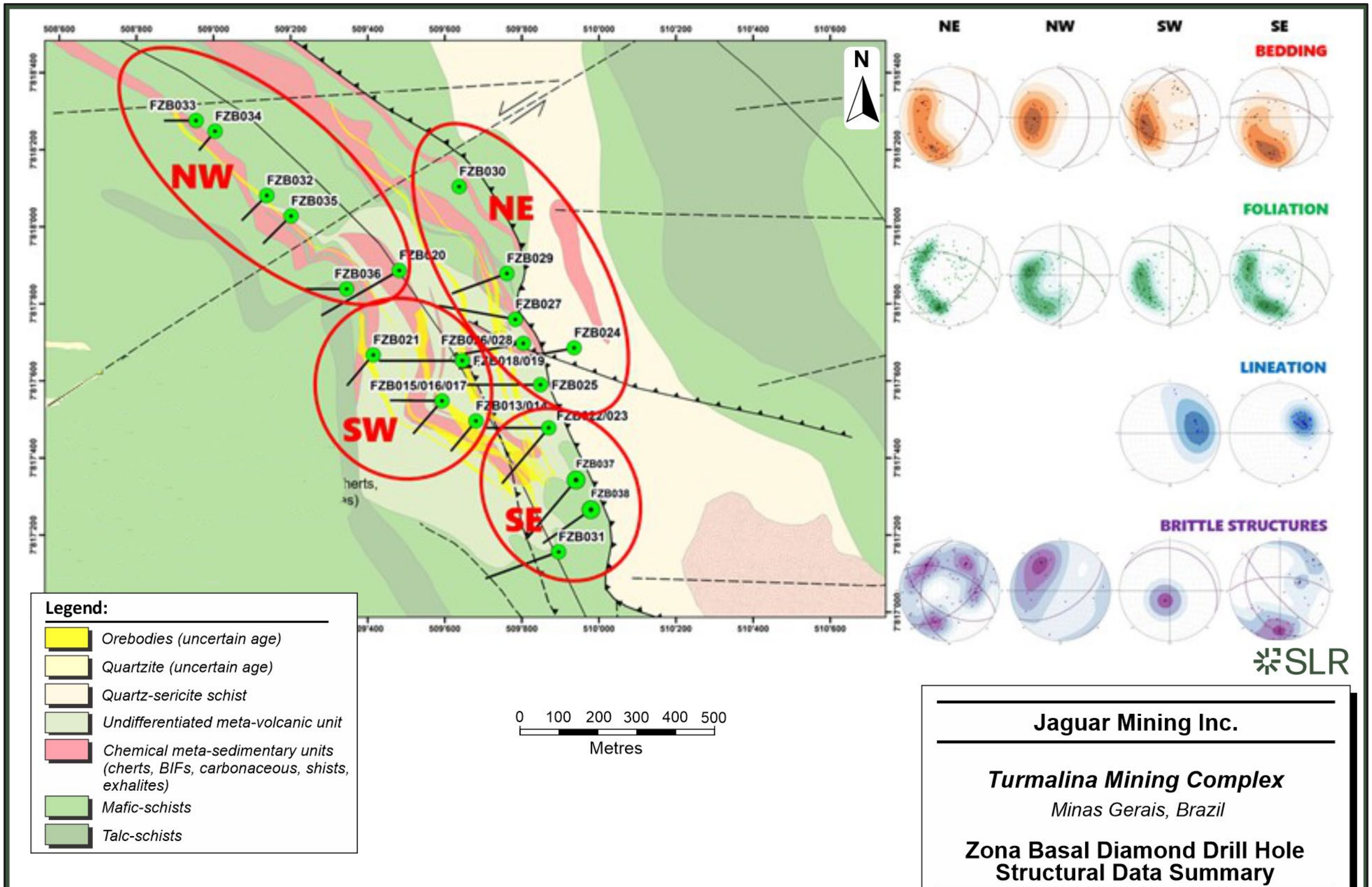
The current interpretation is that the Zona Basal stratigraphic package delineates a southwest-verging overturned and reclined antiformal folded structure that has an east-northeast-plunging axis. With the oriented diamond drill cores (IQ-logger technique), a structural geometric analysis was made, mainly with the use of the S0/bedding readings, wherever they have been of easy identification. As a result of this work, a total of four distinct structural-spatial sectors have been delineated for the inferred Zona Basal folded structure: the NE, SE, SW, and NW domains. Figure 7-22 shows the four distinct structural geometric domains generated using the statistical S0/bedding readings from oriented drill cores.

The SE domain corresponds to the hinge zone of the major antiform; the SW domain would correspond to a local asymmetrically folded portion of the SW limb of the major antiform, adjacent to its closure. The NW and NE sectors correspond to the two limbs of the major antiform, away from the closure zone. The three statistical main/maximum dip orientations of the bedding readings at the distinct domains of the Zona Basal folded structure are: -59° towards an azimuth of 31°; -51° towards an azimuth of 117°; and -42° towards an azimuth of 87° (for the SE, NW, and NE domains, respectively).

The visible and continuous tectonic Sn foliation/cleavage is also locally folded (average axis attitude of -50° towards an azimuth of 65°). The two main average orientations identified for the dip of Sn planes are -58° towards an azimuth of 23°, and -55° towards an azimuth of 102°. The main penetrative linear petrofabrics observed in drill cores are intersection lineations and mineral lineations. As an average, the two types of lineation show the same attitude, plunging -46° towards an azimuth of 68°.

Veins, fractures and small faults at the drill core scale have also been recorded, with the following inferred main orientations for their dipping planes: -54° towards an azimuth of 212°, -58° towards an azimuth of 139°, and -57° towards an azimuth of 25°.

Figure 7-22: Zona Basal Diamond Drill Hole Structural Data Summary



Source: Jaguar, 2023.

7.3.4.3 Mineralization

The Zona Basal satellite deposit is located in the structural footwall of the current mine workings, approximately three kilometers to the west. The Zona Basal deposit hypogenic economic mineralization can be understood as a system that is primarily controlled by a major northwest-southeast oriented transpressive structural movement zone and which is spatially located approximately at the axial-plane setting of the Zona Basal overturned antiform. According to this interpretation, northwest oriented secondary sheared planes originating from this major structural zone had driven ore-forming hydrothermal fluids that ultimately replaced the “more favorable” portions of the Zona Basal stratigraphic package (the volcano-chemical, more “reactive” sedimentary horizons: ferruginous metacherts and carbonaceous phyllites).

The Zona Basal “supergene” (or surficial) mineralization appears to concentrate economic gold grades as well as some silver and other base metals in the weathering halo. The more ubiquitous mineralization style recorded at Zona Basal corresponds to fine grained disseminations of sulphides (arsenopyrite, pyrite, and pyrrhotite) hosted by the favorably replaced volcano-chemical horizons (Figure 7-23).

Figure 7-23 Sulphidation and Alteration in the Zona Basal Drill Core

Source: Jaguar, 2023.

Gold particles occur both as inclusions in the arsenopyrite crystals and in association with the matrix of silicate minerals from the arsenopyrite-rich samples examined in thin section.

7.3.5 Pitangui Project

7.3.5.1 Stratigraphic Setting

The following is excerpted from SRK (2020):

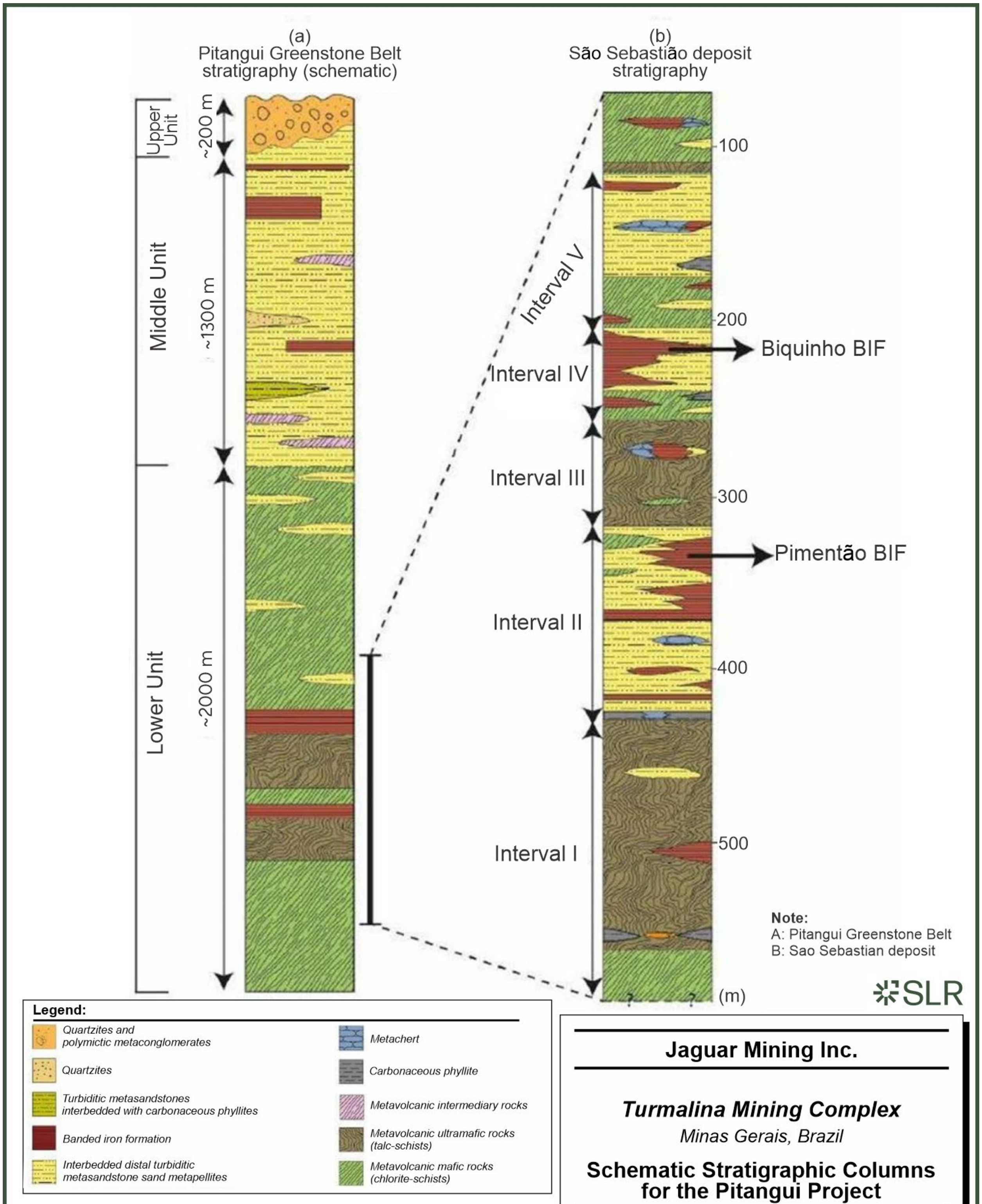
"The geology of the Pitangui Greenstone Belt is divided into the lower, middle, and upper units by IAMGOLD. The lower and middle units can be broadly correlated with the Nova Lima Group.

The lower unit comprises ultramafic and mafic volcanic rocks that are intercalated with Algoma-type banded iron formation, clastic metasediments, and chemical metasedimentary rocks. Schists of chlorite, talc, sericite, and biotite are common within this unit. Clastic and chemical metasedimentary rocks include pelites, sandstones, banded iron formations, and cherts. The stratigraphy of the lower unit can be divided into five main intervals:

1. **Interval I** comprises a succession of interbedded metasandstones, banded iron formations, and contain minor metapelites.
2. **Interval II** represents an approximately 100 m thick package of interbedded turbiditic metasediments. The banded iron formation layers of this interval are collectively referred to as the Pimentão BIF.
3. **Interval III** consists of ultramafic metavolcanic and carbon-rich metapelitic rocks containing thin metachert lenses.
4. **Interval IV** comprises metasedimentary rocks containing lenses of carbon-rich metapelite at the base. This interval is overlain by a two metre to 30 m thick layer of laterally extensive banded iron formation termed the Biquinho BIF.
5. **Interval V** is composed of a roughly five metre thick mafic metavolcanic unit interstratified with a three metre to five meter unit of thinly layered banded iron formations termed the Tomate zone. This interval contains thick packages of metasandstones interbedded with mafic metavolcanic rocks."

Schematic stratigraphic columns of the stratigraphic units of the Pitangui Greenstone Belt are shown in Figure 7-24.

Figure 7-24: Schematic Stratigraphic Columns for the Pitangui Project



Source: Brando Soares et al., 2017.

7.3.5.2 Mineralization

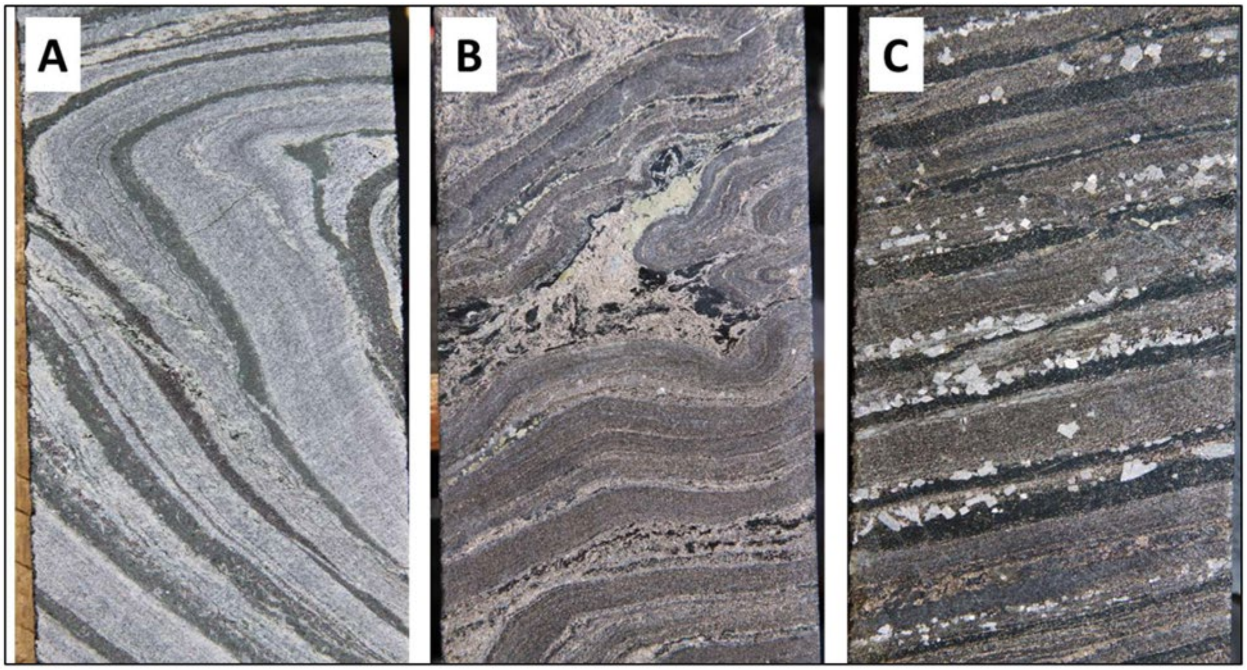
The following is excerpted from SRK (2020):

"Gold mineralization at the São Sebastião deposit is contained within deposits hosted in three main strata-confined sulfidations zones within several stacked banded iron formation layers in the lower unit of the Pitanagui greenstone belt. The mineralized zones are locally named Tomate, Biquinho, and Pimentão from top to bottom. The main mineralized zone is Biquinho. One of the smaller zoned, Pimentão, is located within a thrust-fold with the fold axis gently plunging to the north and gold mineralization concentrated in one of its limbs.

The main mineralized zones in the São Sebastião gold deposit are hosted in the two most continuous banded iron formation packages (Biquinho and Pimentão) of the lower unit, corresponding to intervals II and IV as shown in Figure 7-25. The sulphide mineralization in these zones most commonly occurs as disseminations replacing magnetitite, however occasional massive sulphide mineralization in quartz-carbonate veins and breccias can occur. Pyrrhotite is the dominant sulphide, followed by arsenopyrite, pyrite, and chalcopyrite, which appear in smaller concentrations. The following mineralization styles have been identified in banded iron formations from the São Sebastião deposit (Figure 7-25 and Figure 7-26):

- Disseminated sulphides: generated after the replacement of magnetite by sulphides, this style composes the vast majority of the deposit's volume. This mineralization style is tablular and follows the relict bedding.
- Sulphides in breccia zones: breccia zones with thickness varying between a few centimetres to a few metres in size can be found in the São Sebastião deposit, such as in fold hinges.
- Quartz-carbonate-sulphide veins: these veins contain variable amounts of sulphides and may be spatially associated to breccia zones.
- Other styles of sulphidation: sulphides disseminated in chlorite schists, carbonaceous phyllites, and tourmalinites can also be found.

Figure 7-25 Drill Core Photos Illustrating Mineralized and Barred Banded Iron Formations from the São Sebastião Gold Deposit



Notes: Core size is NQ2, each pictured core is approximately 5.2 cm wide.

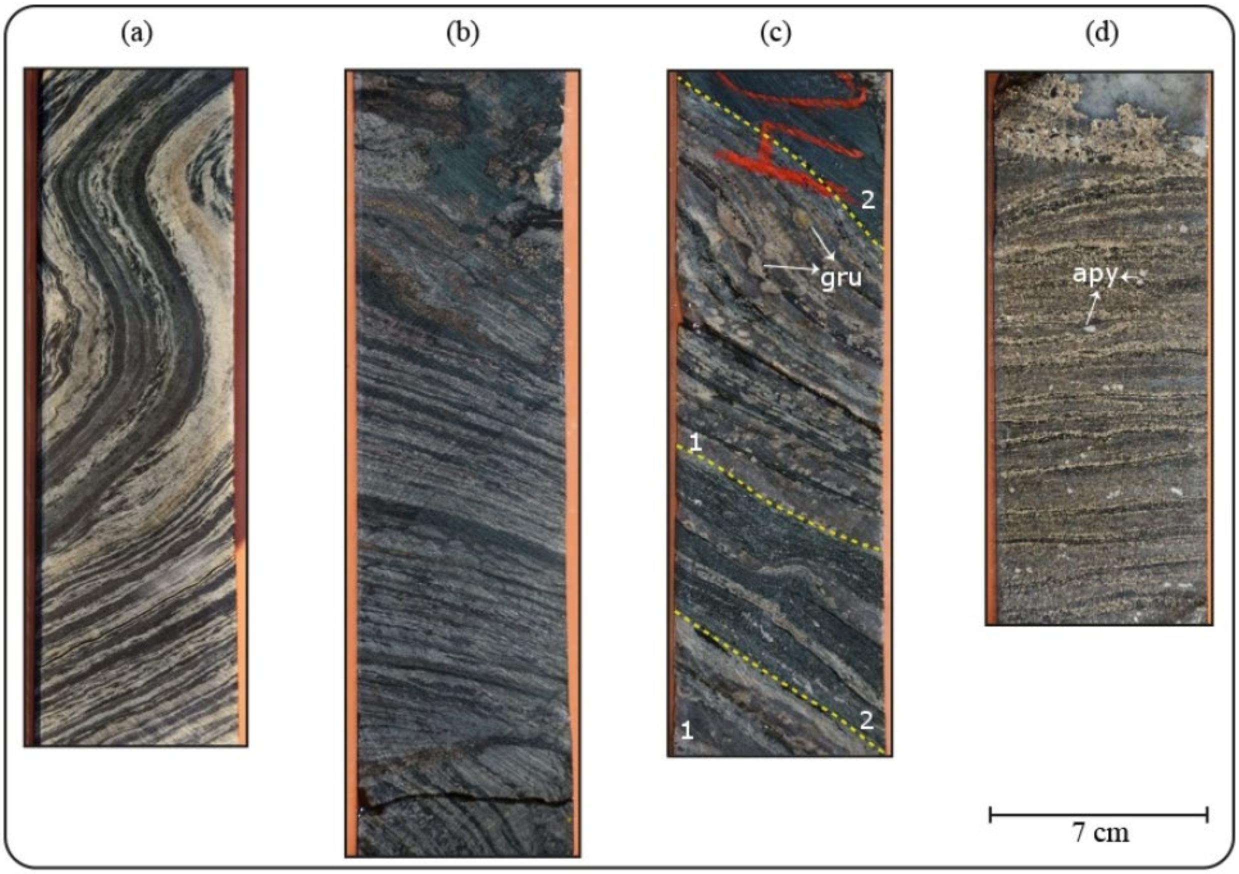
A: Non-mineralized banded iron formation, drill hole FJG56, 275.5 m, 0.019 g/t Au.

B: "Biquinho" mineralization with pyrrhotite replacing magnetite and shall breccia zone containing pyrrhotite and pyrite, drill hole FJG84, 156.6 m, 9.96 g/t Au.

C: "Biquinho" mineralization, euhedral arsenopyrite overgrowing pyrrhotite, drill hole FJG53, 155.6 m, 9.90 g/t Au.

Source: extracted from Almeida et al. (2016) *in* SRK (2020).

Figure 7-26: Drill Core Photos Illustrating Mineralized Banded Iron Formations



A: Oxide-facies banded iron formation displaying alternate dark grey (magnetite-rich) and white (chert-rich) microbands.

B: Oxide-faces banded iron formation with greenish shear-bands (chlorite-rich).

C: Radial grunerite agglomerates (gru) growing between chert-rich and magnetite-rich bands in silicate-facies banded iron formation. 1-shear-band poor domains; 2-shear-band rich domains. Domains are separated by yellow dashed lines.

D: Sulphide faces banded iron formation with disseminated pyrrhotite and euhedral arsenopyrite (apy) crystals.

Source: IAMGOLD *in* SRK (2020)

Gold at the São Sebastião deposit occurs as fine-grained native gold and electrum, with sizes ranging from <5 microns to 200 microns, typically between 10 microns to 20 microns. It is commonly found in pyrrhotite and arsenopyrite crystals, exhibiting various forms such as inclusions, filling fractures, and as fine-grained particles. Small amounts of invisible gold (approximately 150 parts per million) were also detected in less common arsenical pyrite crystals. More details and Scanning Electron Microscopic (SEM) images of gold are shown in SRK (2020).

8.0 Deposit Types

The gold metallogeny in the Iron Quadrangle district is complex. Mineralization within the district has been found in a number of different deposit types and/or styles. The five deposits described herein—the Turmalina Mine, Faina, Pontal, and Pontal South (collectively the Pontal Deposits), Zona Basal, and São Sebastiao deposits—are examples of the deposit diversity in this area. In a broad context, the primary deposit types in this region include the following:

1 Structurally controlled sulphide replacement zones in stratabound deposits such as Algoma-type banded Iron formation (BIF):
   - Characterized by sulphide replacement zones within banded iron formations and the presence of quartz veins and siliceous alteration in metasedimentary packages.
   - The replacement/sulphidation of sedimentary host packages is intricately linked in a temporal-spatial-genetic relationship with the initiation of a district-scale silicification and veining event.
   - Economic gold grades are directly associated with the presence of sulphide phases, mainly pyrite, pyrrhotite, and arsenopyrite.

2 Orogenic gold deposits:
   - A spatial association with large-scale compressional to transpressional structures
   - The mineralized lodes formed over a uniquely broad range of upper to mid-crustal pressures and temperatures, between about 200 to 650°C and 1 to 5 kbar.
   - Occur as disseminated sulphide minerals and gold in hydrothermally altered rocks along shear zones or as auriferous quartz-carbonate-sulfide veins and veinlets in various rock types including mafic, ultramafic, felsic volcanic rocks, and clastic sedimentary rocks.
   - The down-plunge continuities of the orebodies are directly related to structural geometric controls.

3 Supergene gold concentration of gold through weathering processes near the surface:
   - Gold is concentration is a result of leaching, compaction, and transport processes during weathering, often manifesting in the form of secondary gold minerals or enriched zones.
   - Commonly found in weathered bedrock and regolith, which result from the alteration of primary mineralization near the surface.

Where grades and thicknesses permit, gold deposits of these types and styles are amenable to both bulk mining and more selective high grade underground operations.

The MTL region, with its poly-orogenic geological evolution (Archean, Transamazonian, and Brasiliano orogenies), is characterized by the amalgamation of Archean blocks where the rocks of the Pitangui Group outcrop. This stratigraphic Group is surrounded by the Mesoarchean basement of the Divinópolis Complex and intruded by high-K calc-alkaline magmatism (e.g., the Casquilho granitoid, adjacent to some of the Jaguar MTL ore bodies).

The central blocks of this terrain form a synclinorium, whose inverted limb is where a major horsetail-shaped shear zone, responsible for the main gold mineralization, developed during the Archean Pitangui Greenstone Belt orogeny. On this inverted flank, from the base to the top, there is a sequence of quartz-sericite schists, followed by sequences of chemically metasedimentary rocks and metabasalts tectonically overlaid by a clastic sequence of biotite-quartz schists.

The main shear zone that controls the mineralization in the MTL trend (Turmalina-Faina-Pontal) occurs at a slightly oblique angle to the NW-SE strike of the beds, causing the mineralized bodies to gradually change their lithostratigraphic context along the main regional structure. This feature provides alternation of host rocks, hydrothermal buffering reactions, and alteration halos.

The rheology and metamorphic grade also vary along the trend, mainly related to the emplacement of the Casquilho granite (2.7 Ga). During the Paleoproterozoic orogeny (Transamazonian or Minas Accretionary Orogeny), a second phase of gold mineralization/remobilization occurred. This reconcentration process involved low-melting-point chalcophile elements (such as Antimony and Bismuth), which promoted the scavenging of Au through the formation of low-melting-point fluids. These gold-bearing younger fluids then precipitated mostly along the Paleoproterozoic structures (such as the hinge zones of E-W fault-propagation folds, as in Faina), ultimately leading to the increase of gold fineness and grades (refining).

At the Complex, Orebody A and Orebody B are understood to be typical examples of orogenic gold deposits influenced by WNW-ESE-trending shear zones. These deposits are associated with hydrothermal alteration and are surrounded by sedimentary host rocks that have experienced amphibolite-facies metamorphism, estimated to reach a hydrothermal temperature of approximately 650°C. Orebodies C and D share similar primary mineral assemblages but differ in host rocks (chemical metasediments in C and metabasalts in D). The origin of the economic zones of Orebody C is less certain as they are hosted by a stratigraphic horizon composed essentially of unique volcano-chemical BIFs and black carbonaceous schists and may be more similar to structurally controlled sulphide replacement zones in stratabound deposits rather than orogenic gold deposits.

At Faina, the orebodies are classified as orogenic gold deposits with a folded geometry characterized by hinges plunging to the northeast and a faulted structure exhibiting an east-west striking orientation with near-vertical dip. These orebodies are predominantly hosted in metabasalts. Notably, the hydrothermal temperature at Faina is intermediate, ranging between 450°C and 500°C.

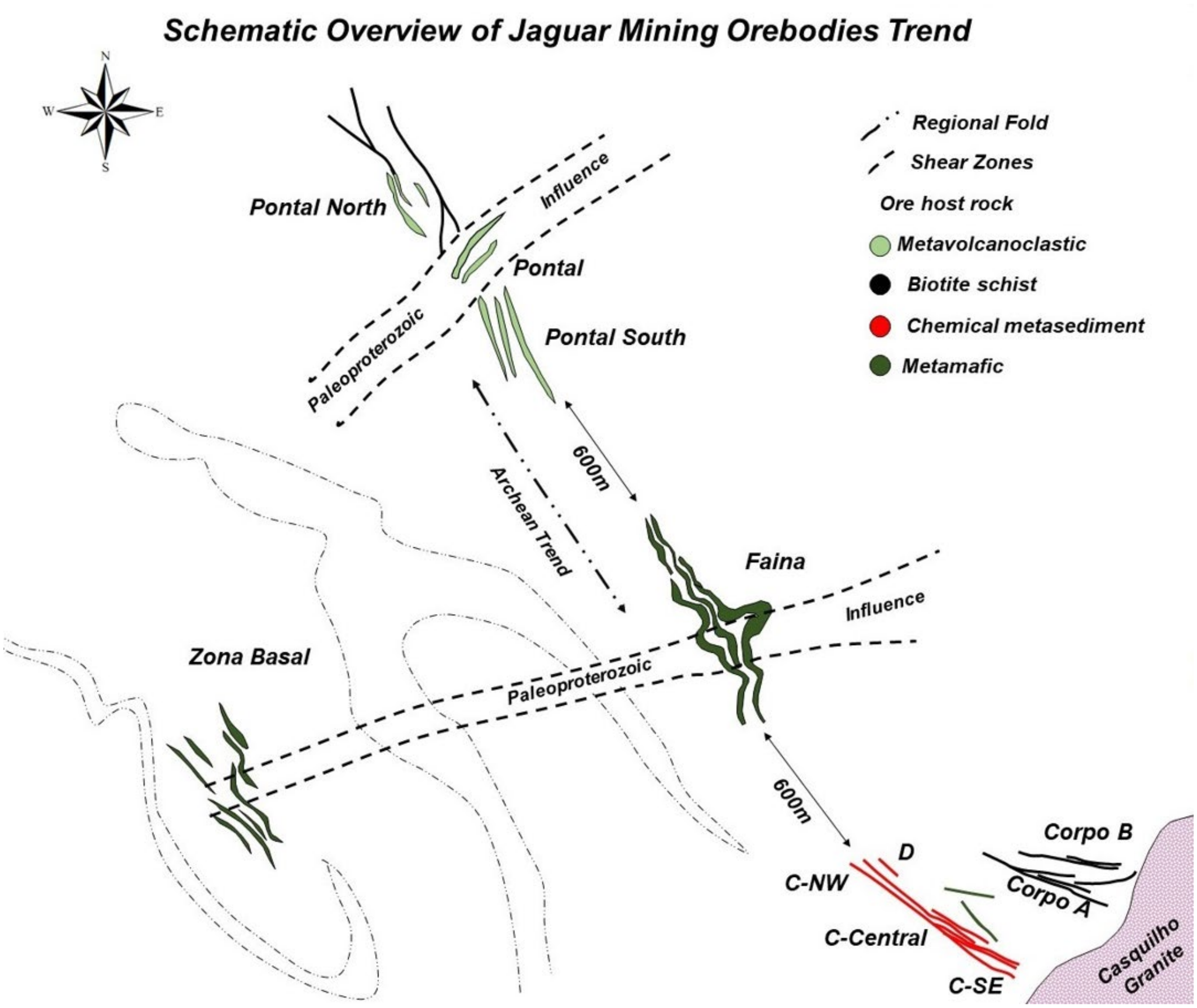
At Pontal, the orebodies are typically classified as orogenic gold deposits, however, certain veins display textural features associated with epithermal-type deposits. In Pontal, located at the northwest end of the shear zone, the mineralization shares a geometric resemblance with Faina (folded/faulted), but it is hosted in volcanic agglomerates. The primary mineral assemblage comprises pyrite+pyrrhotite+arsenopyrite+Au, linked to crustiform veins characterized by lower temperatures (~300°C), potentially indicating an epithermal origin.

At Zona Basal, the orebodies have both mineralization representative of supergene gold deposits as well as hypogene mineralization that is most representative of structurally controlled sulphide replacement zones in stratabound deposits. Despite not being situated at the MTL major shear zone, Zona Basal is positioned approximately 2 km southwest of it, adjacent to the normal limb of the Pitangui Group synclinorium. The critical supergene reconcentration of gold and silver occurs in the leached horizons of Zona Basal. Hypogene mineralization at Zona Basal is primarily concentrated at the hinge zones of the major Basal Unit anticline. Additionally, it is found within thick chemical metasediment rock packages, including metacherts, banded iron formations, and carbonaceous schists, interspersed among metamafic rocks. Hydrothermal temperatures during both stages at Zona Basal are characterized as intermediate (~450°C) and low (170°C).

Figure 8-1 offers a schematic overview depicting the deposition-related deformation phases that act as mechanisms for gold mineralization/remobilization at the Turmalina Mine, Faina, Pontal Deposits, and Zona Basal.

The São Sebastião gold deposit is considered a hypozonal orogenic gold deposit type and, in general, is related to three different mineralization styles. Firstly, it is associated with replacement-style sulpdidation over magnetite, characterized by the prevalence of massive to semi-massive pyrrhotite dissemination interlayered with chert bands. Secondly, sulphides are present in breccia zones, with varying thickness ranging from a few centimeters to a few meters, particularly evident in fold hinges within the deposit. Lastly, quartz-carbonate-sulphide veins play a role in gold mineralization, containing variable amounts of sulphides and showing spatial associations with breccia zones. Electron-microprobe analyses of arsenopyrite indicate a precipitation temperature range between 465°C and 560°C. This temperature interpretation is derived from the context of gold deposition with arsenopyrite occurring during compressional tectonic events. Gold is primarily found as inclusions in late- to post-kinematic pyrite and arsenopyrite, as fracture infills in arsenopyrite, and in contact with gangue minerals.

Figure 8-1: Schematic Overview of Jaguar Deposits and Deposition-related Deformation Phases



Source: Jaguar, 2023

9.0 Exploration

9.1 Summary

AngloGold performed a regional geochemistry survey covering an area of 430 km^2 in the Turmalina region. A total of 875 stream sediments and 446 pan concentrate samples were collected. Stream sediment samples were assayed for Au, Cu, Zn, Pb, Cr, Sb, and As. Pan concentrate samples were assayed for Au only.

Soil geochemistry sampling was executed by AngloGold in both the Faina and Pontal areas with grids varying from 100 m x 20 m to 10 m x 10 m. At Faina, 1,272 soil samples were collected and 16,900 m of lines were opened. At Pontal, 1,698 soil samples were collected and 28,000 m of lines were opened.

Several samples returned gold grades greater than 300 ppb. A significant portion of the soil samples collected from these targets were also assayed for As and Sb. There is a strong relation between gold and As/Sb since gold is associated directly with quartz veins with arsenopyrite and/or berthierite in the region.

Upon acquisition of the MTL Complex in 2004, Jaguar began its exploration activities focusing on the re-interpretation of the AngloGold data (trenches, soil geochemistry, and drilling) to better understand the local geology. These efforts were concentrated on the targets previously identified by AngloGold.

An exploration program was carried out at the Satinoco (Orebody C) target by Jaguar from March 2006 to April 2008 in order to collect sufficient information to prepare an estimate of the Mineral Resources in accordance with CIM (2014) definitions in NI 43-101. This program included the opening of about 700 m of trenches and the collection of 146 channel samples crossing the mineralized zone and a complementary diamond drill program.

Jaguar's exploration is focused on brownfields exploration in order to identify new mineral resources that would potentially increase its mineral reserves inventory and utilize existing capital infrastructure base, as well continuously growing the mineral resource base in the active mines.

The main brownfields exploration and growth projects currently underway at Turmalina include the Faina deposit Area, the Zona Basal deposit, and the Pontal South-Pontal Trend. These three targets are in within a few kilometres of the Turmalina Mine and the Turmalina Plant.

From 2019 to 2021, drone based magnetic aerial surveys were completed for Jaguar, covering portions of the Zona Basal, Faina, and Pontal Trends. The new airborne magnetic datasets were acquired using a drone (hexacopter) with GEM magnetometer as part of an Avant Geofisica's DRONEmagTMsystem survey. Southern Geoscience Consultants (SGC) has produced an integrated interpretation of the magnetic data for Jaguar and has proposed targets for follow up testing, either by surface geological mapping activities or by diamond drilling. The highest priority geophysical targets suggested were commonly those coincident with gold in soil anomalies.

Magnetic data was initially collected over lines with 100 m spacing. Some tie lines were also acquired. Small areas with promising results were covered with tighter 25 m spaced lines. The drone flew at an average height of 50 m, at an average speed of 8 m/s with measurements every 0.2 seconds.

9.2 Faina Deposit

Information relating to early exploration work carried out at the Faina deposits is limited. Exploration by AngloGold in 1980 included ground geophysical survey with grids size of 40 m x 100 m with 24 lines covering about 130 ha completed. Several geophysical anomalies were defined by both methods and most of them showed a strong relation with the geochemical anomalies. This information was used for the planning of trench locations.

In 1986 AngloGold, collected 1,272 soil samples using grids varying from 100 m x 20 m to 10 m x 10 m. Several samples returned gold grades greater than 300 ppb. A significant portion of the soil samples collected from these targets were also assayed for As/Sb.

Jaguar continued collection of soil samples through to 2009. Several samples returned gold grades greater than 300 ppb and were successful in outlining the surface expression of the Faina deposit. A significant portion of the soil samples collected from these targets were also assayed for As and Sb. A strong correlation between gold and As/Sb were observed as gold is associated directly with quartz veins with arsenopyrite and/or berthierite in the region.

In 2023, electrical properties (resistivity and chargeability) of 462 drill core samples selected from the Faina deposit were measured via Sample Core Induced Polarization (SCIP) GDD tester. The SCIP is a portable, battery-operated instrument for evaluating the resistive properties and Induced Polarization (IP) response (apparent resistivity and time domain induced polarization) of the samples. With this type of survey, one can easily and cost-efficiently assemble the data required in order to design an appropriate and more elaborated geophysical survey, like an IP survey if appropriate. The SCIP also assists in a better definition of IP inversions. The chosen methodology applied at the Faina deposit consisted of selecting pairs of diamond drill holes for each of the six cross-sections (100-150m spaced approx.) that traversed both the stratigraphy and the mineralization envelope of the Faina deposit. For each drill hole, one SCIP sample was selected every nine metres and/or at every lithological unit for all the geological contacts throughout the drill hole. Each sample was submerged in natural still water for 48 hr consistently and then measurements of the electrical properties were collected, with a total of three readings per sample. The objective was to establish whether the resistivity and/or induced polarisation geophysical methods could be used at the Faina deposit to search for additional gold mineralization.

In the second quarter of 2023, as the development of underground galleries and ore drives progressed from Turmalina Mine towards the Faina deposit, detailed (1:500) geological mapping commenced at a scale of 1:500. To date, three approximately parallel drives have been developed (namely PNWRP2, PNWRP1, and FN435NW from SW to NE) in the so-called NW Project (PNW) or Faina Project. The PNW starts at approximately 250 m (horizontal distance) to the NW of the CNW orebodies. Development has progressed approximately 1,100 m along strike to the northwest and together the parallel drives add up to approximately 3,230 m of interconnecting development. The mapping completed to date indicates that the gold mineralization is hosted in both chemical meta-sediments (banded iron formations and meta-cherts) in the footwall and in meta-basalts in the hanging wall. The host rocks are folded with northeast plunging fold noses and are displaced by a number of east-west striking, semi-vertical faults. Two main foliation planes have been observed in the geological mapping program. The first set of foliation planes (Sn) have northeast dips while the second set of foliation places (Sn+1) are steeply dipping to either the north or south. An important metallogenic relationship is observed between the northeast plunging direction of the main fold at the Faina deposit. Interpretation of textural features suggest that the deformation event was responsible for the later gold remobilization by low melting point chalcophile elements, mainly antimony, increasing the gold grade and its fineness in this aforementioned hinge zone.

9.3 Pontal Deposit

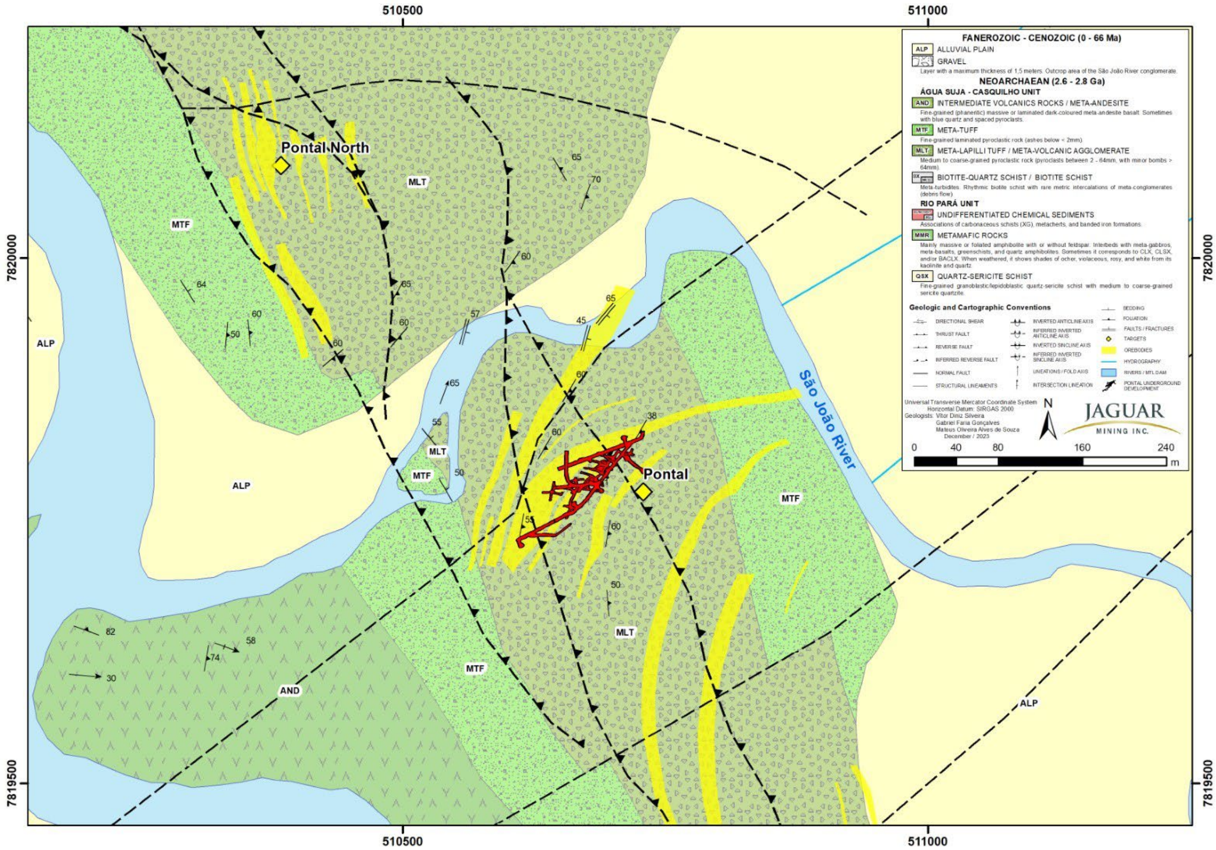
The Pontal deposit area is located on Mineral Tenements 812.004/1975 and 830.027/1979, approximately four kilometres northwest of the Turmalina mining facilities, and includes the Pontal (LB1) and Pontal North (LB2) mineralized zones, as well as the recent exploration target Pontal South.

During the 1980s and 1990s, the Pontal, Faina, and Turmalina target areas were surveyed by Mineração Morro Velho Ltda. (MMV) and by Unigeo, both of which are former AngloGold subsidiaries. These companies executed an aggressive exploration program in the Pitangui and Conceição do Pará townships, and defined gold mineral resources, which enabled the implementation of several open pit mines and a heap leaching plant project. This initial open pit/heap-leaching operation was shut down in 1993.

During that exploration phase, AngloGold´s subsidiaries executed a horizontal drift and a ramp at the Pontal LB1 target (Figure 9-1), aimed at accessing the mineralization below the weathered zone. The goal was to evaluate the economic shoot continuities and to collect fresh mineralized samples for the initial metallurgical studies.

In September 2004, Jaguar purchased the MTL Complex from AngloGold, and started a complementary exploration program aimed at evaluating the gold resources and exploration potential. In 2006, Jaguar commenced the implementation of the Turmalina underground project, and an exploration program in some nearby sectors inside its mineral concession which also covered the Pontal area. Until 2010, at the Pontal deposits, the LB1 mineralized body had been drilled to a depth of only 200 m, while the LB2 mineralized body had been drilled to a depth of only 100 m. Additional drilling was carried out in 2021 which resulted in the discovery of a new zone of gold mineralization currently referred to as the Pontal South deposit.

Figure 9-1: Pontal Deposits Geology Map Showing Underground Drift and Ramp



Source: Machado, 2011

9.4 Zona Basal Target

The Zona Basal target area is located on Mineral Tenements 803.470/1978, 831.126/2018, 831.617/2003 and 833.584/2012, approximately 3.0 km to 3.5 km west of the Turmalina mining facilities.

Following the exploratory soil geochemistry sampling in 2018, a total of 14 trenches were excavated, totaling 1,434 m in length. These trenches were geologically mapped, and samples were collected of any material that was believed to contain gold mineralization. A total of 1,055 channel samples were collected, and the best results/intercepts initially obtained are presented in Table 9-1. A figure providing an illustration of the location of the trenches is RPA (2017).

Channel and trenches sampling was performed on outcrops and artificial exposures, usually of saprolite, as fresh rock is rare. The exposure is initially “cleaned”, removing any superficial material (approximately 5 cm) which might contain non-representative transported particles and is most exposed to weathering, including rain leaching. Then, channel sample limits are marked by a technician or a geologist with small wood stakes (using spray paint if necessary), in an orientation to obtain the best knowledge about the outcrop being sampled, usually crosscutting the target feature and respecting lithological contacts. The sampler and an assistant collect the sample along the defined channel, with a duck head hammer and a clean aluminum tray, extracting material from an approximately five centimetre wide and three centimetre deep band. The total weight of a one metre sample is approximately three kilograms. It is bagged and identified. Geologic description and structural bearings are taken by a geologist, along with a field sketch.

Table 9-1: Summary of Positive Trench Sampling Results, Zona Basal

Trench	Composite
TZB034	8.65 m at 0.70 g/t Au
	4.8 m at 0.82 g/t Au
TZB037	8.70 m at 0.87 g/t Au
TZB041	17.80 m at 1.29 g/t Au
	7.30 m at 0.97 g/t Au
TZB042	4.50 m at 1.03 g/t Au
TZB047	1.50 m at 18.60 g/t Au
	7.90 m at 3.78 g/t Au

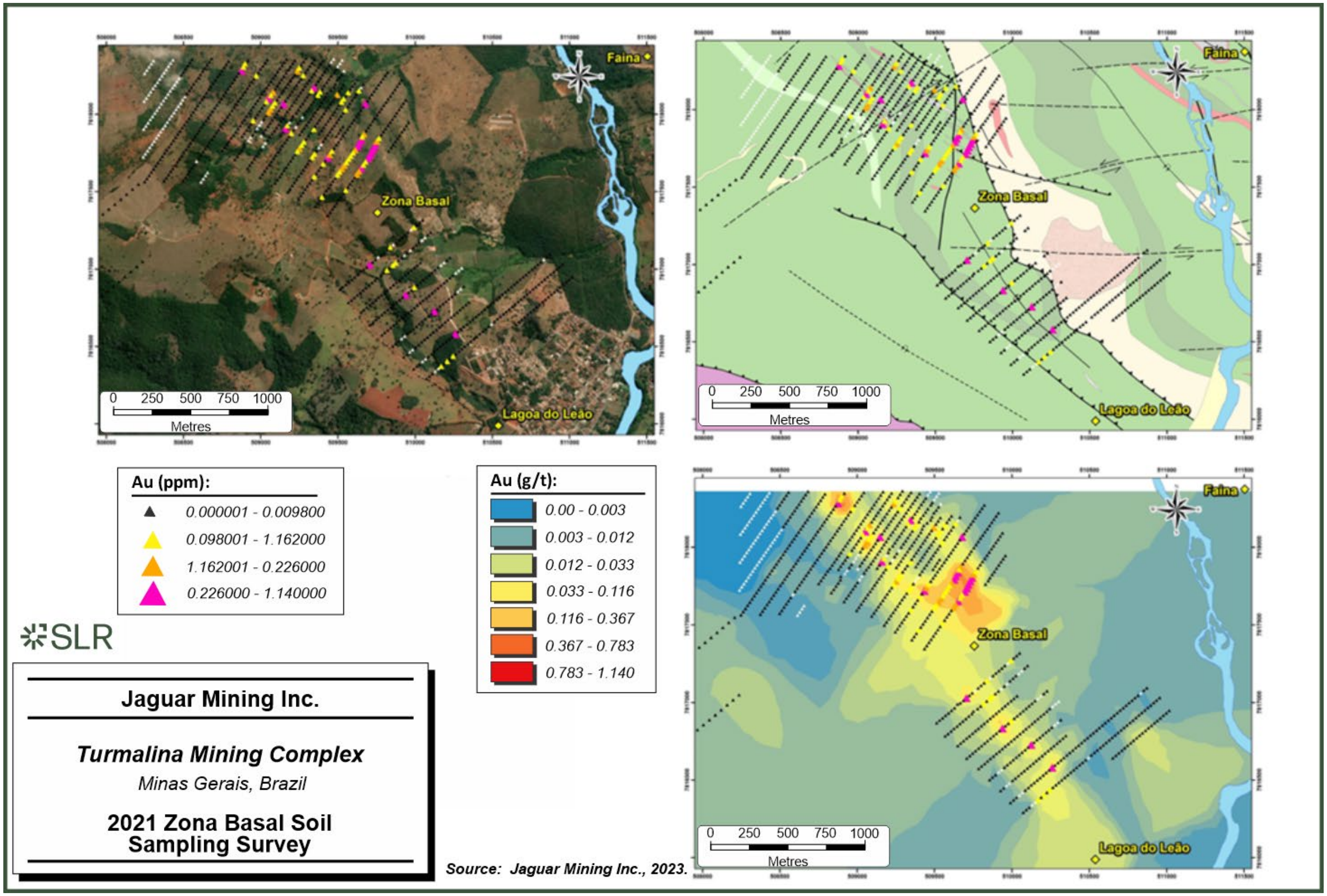
Geological mapping activities were carried out by Jaguar's exploration team in 2018 over an area of approximately 78 ha – at a scale of 1:2,500 – in the vicinity of the Zona Basal target. This mapping program discovered numerous occurrences of outcrops, mostly located along the various drainages and streams in the area. The 2018 exploration program carried out over the Zona Basal target discovered gold mineralization over an area of approximately 1,000 m to 1,250 m along strike and approximately 500 m wide across the strike. This target area of the MTL Complex was not previously considered as having high potential for hosting economic gold mineralization.

In 2021, Jaguar also carried out a program of soil sampling, chip sampling, trenching, and geological mapping on the Zona Basal target, which is located approximately four kilometers to the west of the Turmalina Mine. No further exploration activities were carried out at the Zona Basal deposit in 2022 or 2023.

The soil sampling program involved the collection of 670 soil samples, which were analyzed for gold and 48 other elements by the ALS Chemex laboratory located in Vespasiano, Minas Gerais state. ALS Chemex independent of Jaguar and are accredited under ISO/IEC 17025:2017 and ISO 9001:2015. This soil sampling program was carried out along a series of 12 sampling lines that were spaced approximately 50 m apart. The soil sampling program detected the presence of two gold anomalies that are oriented in a northwest-southeast direction, approximately parallel to the regional stratigraphic trends. The gold anomalies also contain elevated values of arsenic and antimony. Detailed mapping completed in the area of the soil anomalies also found several small, gossanous outcrops where grab samples yielded grades between 1.38 g/t Au and 26.5 g/t Au.

Figure 9-2 presents the results of the 2021 exploratory soil geochemistry campaign that highlighted the surficial anomaly related to the Zona Basal gold deposit.

Figure 9-2: 2021 Zona Basal Soil Sampling Survey



The soil sampling grid was planned based on local geological knowledge, orientating the lines to best crosscut the geologic structures which are expected to host gold mineralization. With the aid of a handheld global positioning system (GPS) unit, the exploration team opened trails to reach the established sampling sites. Samples were collected from the B soil horizon using a post hole digger. For each sample site, the depth of the B soil horizon is reached in different depths depending on the geomorphological setting. If rock bedding is reached, it was penetrated in order to collect the underlying residual soil. For each sample, one kilogram to two kilograms of B horizon soil is withdrawn and placed over a clean PVC canvas. The sample is described, bagged, and identified. If necessary, the sample is disaggregated and sieved to remove the coarse material (> 2 mm).

9.5 Exploration Potential

At Turmalina Mine, the ongoing exploration strategy should focus on planned activities, including targeting shallow extensions along the Orebody B trend. Concurrently, exploration efforts should involve drilling down-plunge and along-strike projections of Orebody C. Further exploration programs across Turmalina Mine land holdings aim to discover additional mineralized zones and assess the strike and depth potential of Orebody D.

At the Zona Basal deposit, exploration programs should aim to evaluate the potential at-depth of the existing mineralization and also test the influence of a second deformational event that remobilizes gold together with antimony minerals, as observed in the Faina and Pontal deposits.

For the Pontal deposit, future drilling is recommended to target extensions along the strike towards the northwest, following interesting magnetic geophysical anomalies and down-dip from higher-grade mineralized intercepts, aiming at the local plunge. The gap between Pontal South and Faina, following the strike of metavolcanic agglomerates, should be drilled. Additionally, efforts should be made to confirm the orientations of mineralization northeast of the primary lithological contacts.

The assessment of the exploration potential of the newly acquired Pitangui Project is ongoing.

10.0 Drilling

10.1 Summary

Jaguar has continued to carry out drilling and channel sampling programs through 2023 that focused primarily on Orebodies B and C. Current drilling and sampling practices involve the initial delineation of the location of the mineralized lenses using either surface-based or underground-based drill holes as appropriate. Jaguar has established the following Standard Operating Procedures that are followed for the drilling, logging, and sampling of all surface-based or underground-based drill holes:

- Levantamentos Topográficos (Topographic surveying)
- Instalação de Sonda (Location of drill holes)
- Jan-Pro-Op-023-Sondagem de Superficie (Surface-based drilling)
- Levantamentos de Amostras e Furos de Sonda (Drill core sampling procedures)

Once sufficient primary underground access has been established, the mineralized lenses are further outlined by underground-based drill holes at a nominal spacing of 25 m to 50 m. For the 2023 drilling program, all drilling was completed from underground stations.

During the 2022 and the January to September 2023 period, surface-based and underground-based drilling programs were carried out at the Turmalina Mine, the Faina deposit, and the Pontal deposit.

Table 10-1 summarizes the drilling carried out at the MTL Complex to date.

Table 10-1: Summary of Diamond Drilling at the MTL Complex

Year	Number of Holes	Drilling Type	Total Length (m)
Turmalina Mine			
2005	83	Core	22,721
2006	38	Core	8,793
2007	51	Core	13,401
2011	316	Core	20,963
2012–2015	1,095	Core	80,437
2016	254	Core	17,167
2018	318	Core	26,781
2019	258	Core	21,360
2020–2021	749	Core	73,416
2022	253	Core	37,538
2023 (January to September)	201	Core	16,285
Sub-total, Turmalina Mine	**3,616**		**338,862**
Faina Deposit			

Year	Number of Holes	Drilling Type	Total Length (m)
2005–2020	378	Core	67,443
2021	10	Core	2,918
2022	50	Core	17,559
2023	8	Core	991
Sub-total, Faina Deposit	**446**		**88,912**
Pontal Deposits			
2005–2020	113	Core	14,090
2021	6	Core	1,466
2022	8	Core	1,981
2023	0	Core	0
Sub-total, Pontal Deposit	**127**		**17,537**
Zona Basal			
2020	26	Core	3,831
2021	154 7	Reverse Circulation Core	8,508 922
2022	0		0
2023	0		0
Sub-total, Zona Basal	**187**		**13,261**
Pitangui			
2011	6	Core	1,319
2012	22	Core	7,747
2013	40	Core	14,497
2014	55	Core	21,067
2015	24	Core	7,674
2016	6	Core	2,166
2017	32	Core	9,567
2018	43	Core	17,600
2019	12	Core	6,396
Sub-total, Pitangui	**240**		**88,034**
Grand Total	4,566		546,606

10.2 Turmalina Mine

Jaguar completed a program of delineation diamond drilling in 2022 and 2023 from underground stations where 454 holes with a total combined length of approximately 53,823 m were completed.

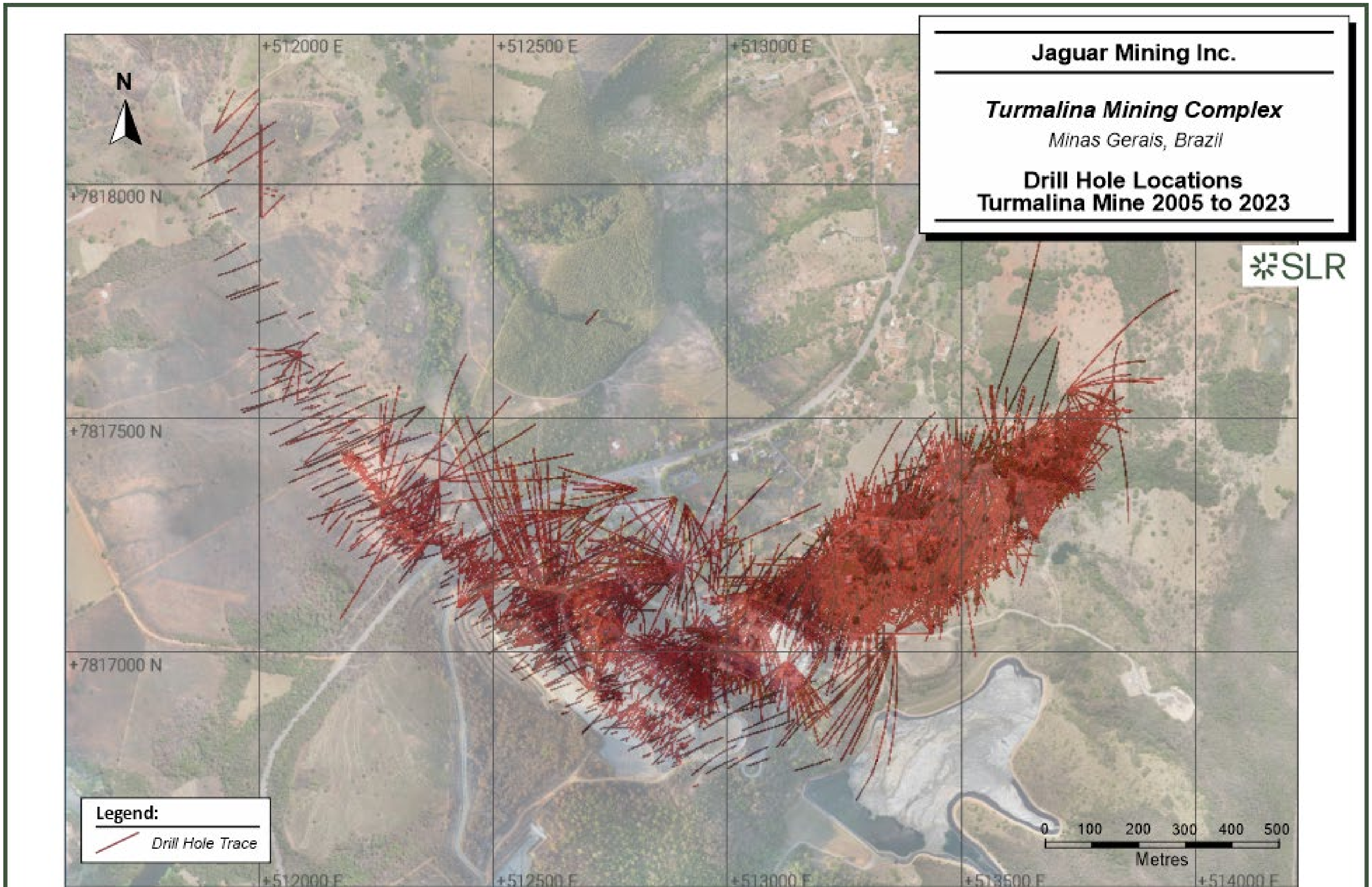
The drill holes mostly tested the along-strike or down-plunge continuation of Orebodies B and C. The locations of all drill holes completed in the Turmalina Mine are shown in Figure 10-1. Figure 10-2 illustrates the location of the drill holes from the 2022 to 2023 campaigns

A selection of the significant intersections encountered at the Turmalina Mine during the 2022 underground drilling campaigns, using the uncapped gold assay values, is provided in Table 10-2.

Table 10-2: Summary of 2022 Significant Intersections, Orebodies B and C

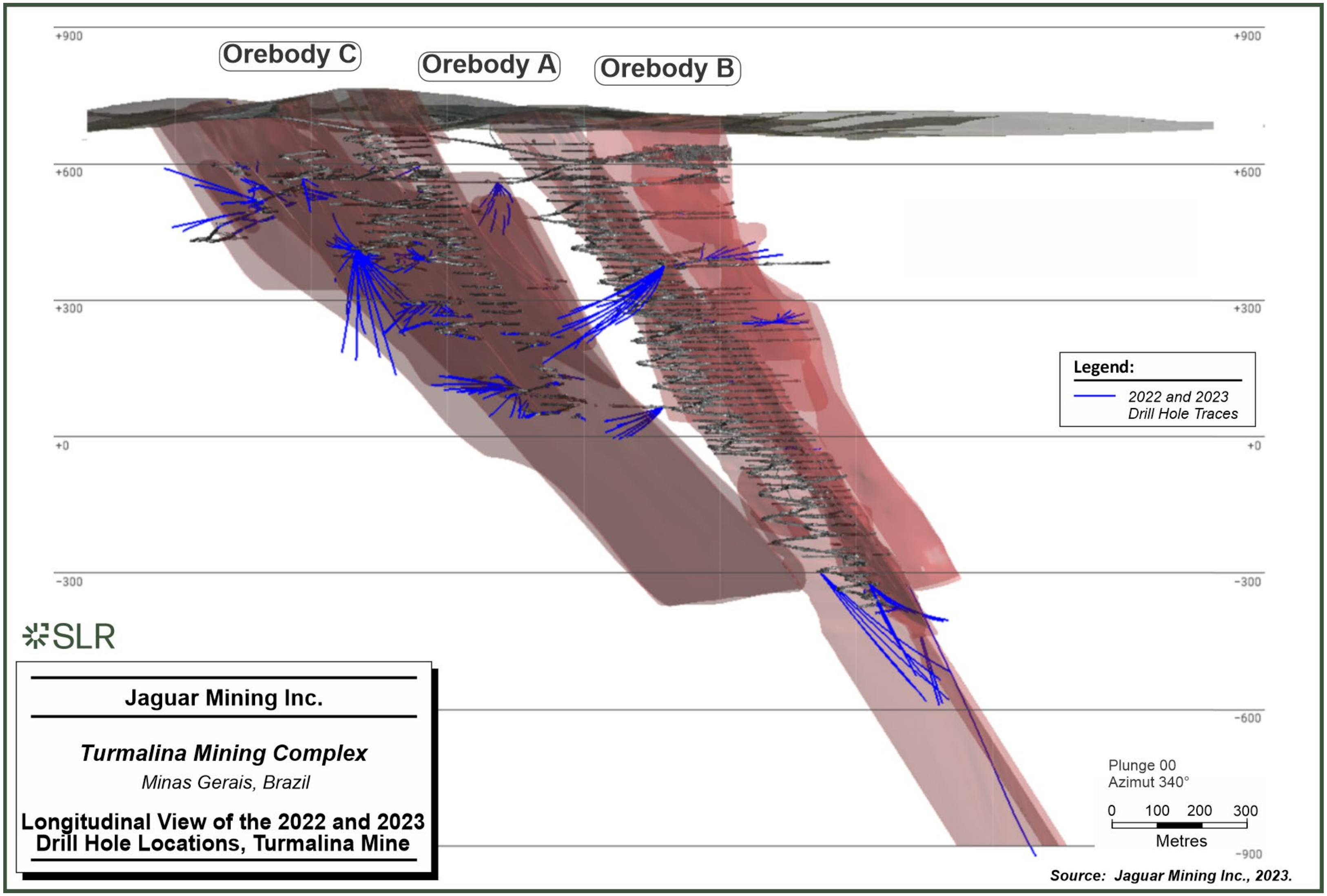
Hole ID	From (m)	To (m)	Downhole Interval (m)	Estimated True Width (m)	Grade (g/t Au)
Orebody C					
FTS2165	60.4	70.3	9.82	6.6	3.88
FTS2280	132.4	138.8	6.34	4.6	11.56
FTS2285	147.1	155.8	8.67	6.8	8.08
FTS2218	159.7	165.7	6.05	5.4	22.87
Orebody B					
GR390LM01	65.3	84.4	19.1	7.6	11.58
B390LM12	4.6	11.6	7.0	6.2	9.60
B390LM11	2.3	9.8	7.5	6.4	13.54

Figure 10-1: Drill Hole Locations, Turmalina Mine 2005 to 2023



Source: SLR, 2023.

Figure 10-2: Longitudinal View of the 2022 and 2023 Drill Hole Locations, Turmalina Mine



Source: Jaguar Mining Inc., 2023.

The past surface-based diamond drilling programs at the Turmalina Mine were carried out by the drilling contractor Mata Nativa using HQ and NQ tools. HQ-sized equipment was used for the portion of the hole that traverses the saprolite horizon, and the hole diameter was then reduced to NQ when the fresh rock was reached. The diamond drill core procedures adopted by Jaguar are described below:

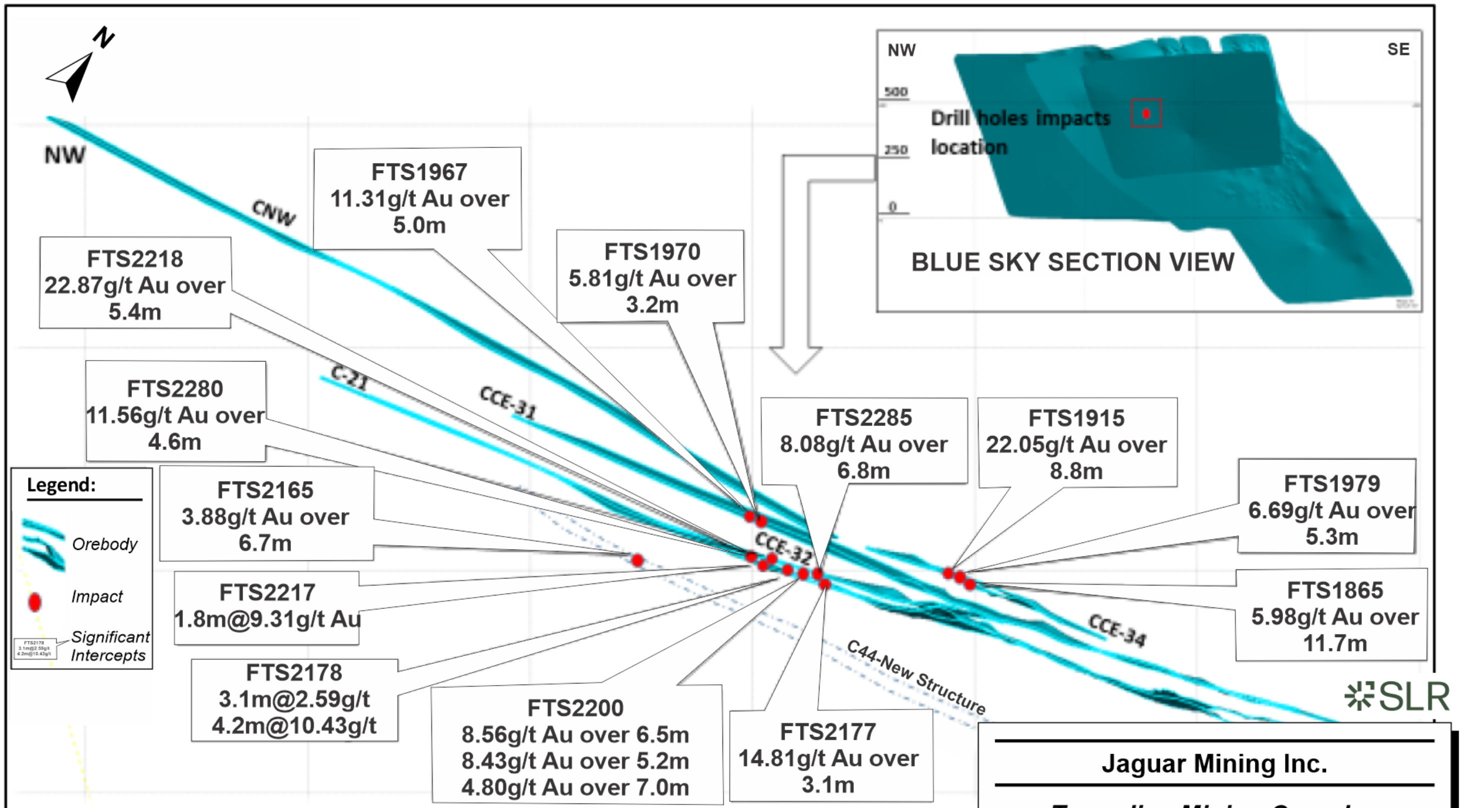
- Only drill holes with more than 85% core recovery from the mineralized zone were accepted.
- Drill hole deviations (surveys) were measured by Sperry-Sun or DDI/Maxibor equipment.
- The cores were stored in wooden boxes of one metre length with three metres of core per box (HQ diameter) or four metres of core per box (NQ diameter). The hole's number, depth, and location were identified in the boxes by an aluminum plate on the front of the box and by a water-resistant ink mark on its side. The progress interval and core recovery are identified inside the boxes by small wooden or aluminum plates.

The underground-based drill holes shown in Figure 10-2 for the 2022 and 2023 drilling programs were completed by Jaguar and a drilling contractor. The drilling was carried out using NQ, BQ, and LTK core diameters and followed Jaguar's established drilling procedures.

The down-plunge limits of the gold grades and the economic ore zones of the Turmalina deposit have not been defined by the drilling completed to date. The SLR QP notes that there is a possibility of discovering additional mineralized zones elsewhere in the mine stratigraphy and supports Jaguar's plans to target shallow extensions to mineralization along the Orebody C trend. The mineralized interval intersected by drill hole FTS2165 (3.88 g/t Au over 6.7 m, Figure 10-3) supports the potential for the discovery of parallel mineralized zones, as this mineralized interval is located in the structural footwall to Orebody C. The SLR QP also notes the potential for discovery of further mineralization along the down-plunge and along-strike projections of Orebodies B and C. The SLR QP is of the opinion that Jaguar should continue drill programs to outline the along-strike and down-plunge continuation of Orebody B and Orebody C where drill intercepts continue to demonstrate economic viability.

The SLR QP notes that the deposits are well drilled and well sampled. The drilling and sampling protocols permit the identification and delineation of the mineralized areas with confidence. The drilling and sampling practices are carried out to a high standard. The SLR QP has not identified any drilling, sampling, or core recovery issues that could materially affect the accuracy or reliability of the core samples and drill holes from both the underground and surface/exploration drilling initiatives.

Figure 10-3: Plan View of Orebody C Recent Drilling Showing Location of Potential New Structure Intersected by DDH FTS2165



Source: Jaguar Mining Inc., 2023.

10.3 Faina Deposit

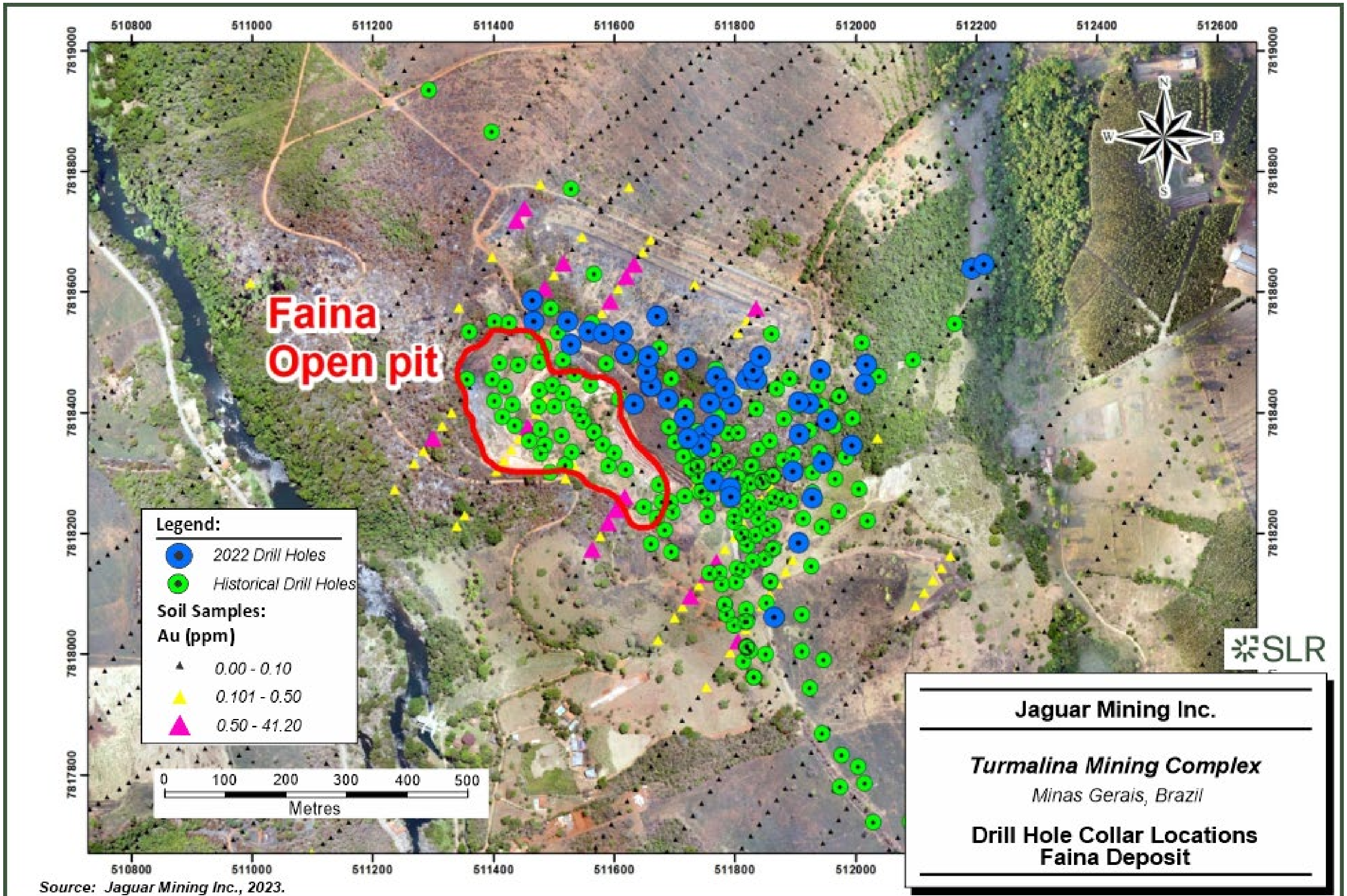
Following the initial discovery, several drilling programs were initiated. Holes FUH-001 to FUH-026 were completed in 1987 by AngloGold. Jaguar began drill testing to define the size, shape, and grade distribution of the Faina deposit in 2009, with the drilling programs continuing through to 2013. These programs resulted in the mining of the shallow oxide portions of the Faina deposit via an open pit, but due to the refractory nature of the sulphide mineralization beneath the oxide zone, the un-weathered deeper portion of the deposit remains to be exploited.

Drilling programs were then re-initiated in 2020 and have continued through to 2023 with the goal of increasing the confidence category of portions of the deposit from the Inferred Mineral Resource category to the Indicated Mineral Resource category. The drilling programs completed at the Faina deposit in 2022 and 2023 were carried out by Major Drilling located in Belo Horizonte.

To-date, a total of 446 drill holes have been completed at the Faina deposit for a total length of approximately 88,912 m (Figure 10-4). The cut-off date for the drill hole database used in the Faina Mineral Resource estimate is September 9, 2022, and Figure 10-4 does not include eight additional holes drilled after that date. SLR is of the opinion that the eight additional holes would not have a material impact on the Mineral Resources, as three holes were drilled within areas of inferred classification, one hole was drilled within an area with indicated classification, and the four others were drilled outside the Mineral Resource area. A selection of significant intersections using the uncapped gold assay values from the drilling completed in 2022 is provided in Table 10-3.

The limits of the gold mineralization at the Faina deposit remain untested by drilling both along strike and at depth.

Figure 10-4: Drill Hole Collar Locations, Faina Deposit



Source: Jaguar Mining Inc., 2023.

Table 10-3: Summary of 2022 Significant Intersections, Faina Deposit

Hole ID	From (m)	To (m)	Downhole Interval (m)	Grade (g/t Au)
FUH180	216.2	236.9	20.8	2.52
Including	*222.4*	*227.0*	*4.6*	*6.28*
FUH183	192.6	205.7	13.1	3.69
Including	*204.7*	*205.7*	*1.0*	*24.80*
FU185	61.9	77.5	15.6	3.27
Including	*74.5*	*77.5*	*3.0*	*9.42*
FUH193	146.8	170.9	24.1	1.92
Including	*160.6*	*162.3*	*1.7*	*8.37*
FUH196	279.0	290.0	11.0	7.10
Including	*280.0*	*289.0*	*9.0*	*8.20*
FUH205	289.2	296.0	6.8	9.57
Including	*289.2*	*290.0*	*0.8*	*77.70*
FUH208	196.5	224.0	227.6	2.22
Including	*201.5*	*209.2*	*7.7*	*5.18*

10.4 Pontal Deposits

Up to 2010, the drilling activities at the Pontal deposits primarily targeted material near the surface. The LB1 mineralized body was drilled to a depth of only 200 m, and the LB2 mineralized body was drilled to a depth of only 100 m. Subsequent drilling in 2021 led to the identification of a new gold mineralization zone, now known as the Pontal South deposit.

Drilling activities in 2021 were targeted to test for the strike extension of the gold mineralization found at the Pontal deposit. Drill hole PTL094 of this drilling program was successful in discovering a new gold intersection that contained 2.95 g/t Au along a core length of 24.9 m. The intersection in drill hole PTL094 is located approximately 200 m along the southeastern strike extension of the Pontal Main deposit.

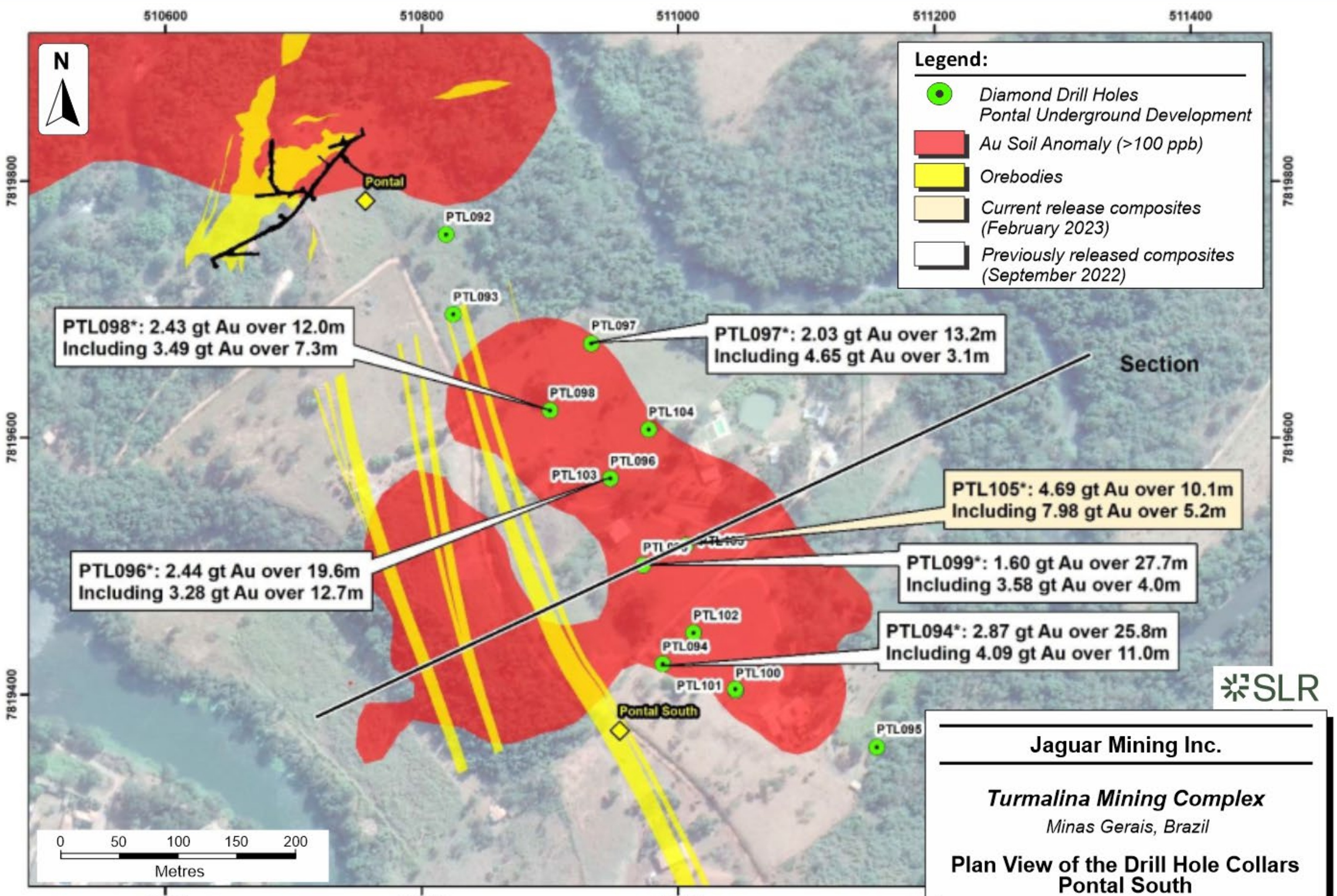
Eight additional drill holes were completed in 2022 by Major Drilling of Belo Horizonte to test for the extensions of the gold mineralization located by drill hole PTL094. A summary of significant intersections returned from the Pontal South deposit is presented in Table 10-4. A plan view of the collar locations for the Pontal South area is presented in Figure 10-5, and a cross section view showing drill hole PTL105 is presented in Figure 10-6.

Table 10-4: Summary of Significant Intersections, Pontal South Deposit

Hole ID	From (m)	To (m)	Downhole Interval (m)	Grade (g/t Au)
PTL094	48.05	72.95	24.9	2.95

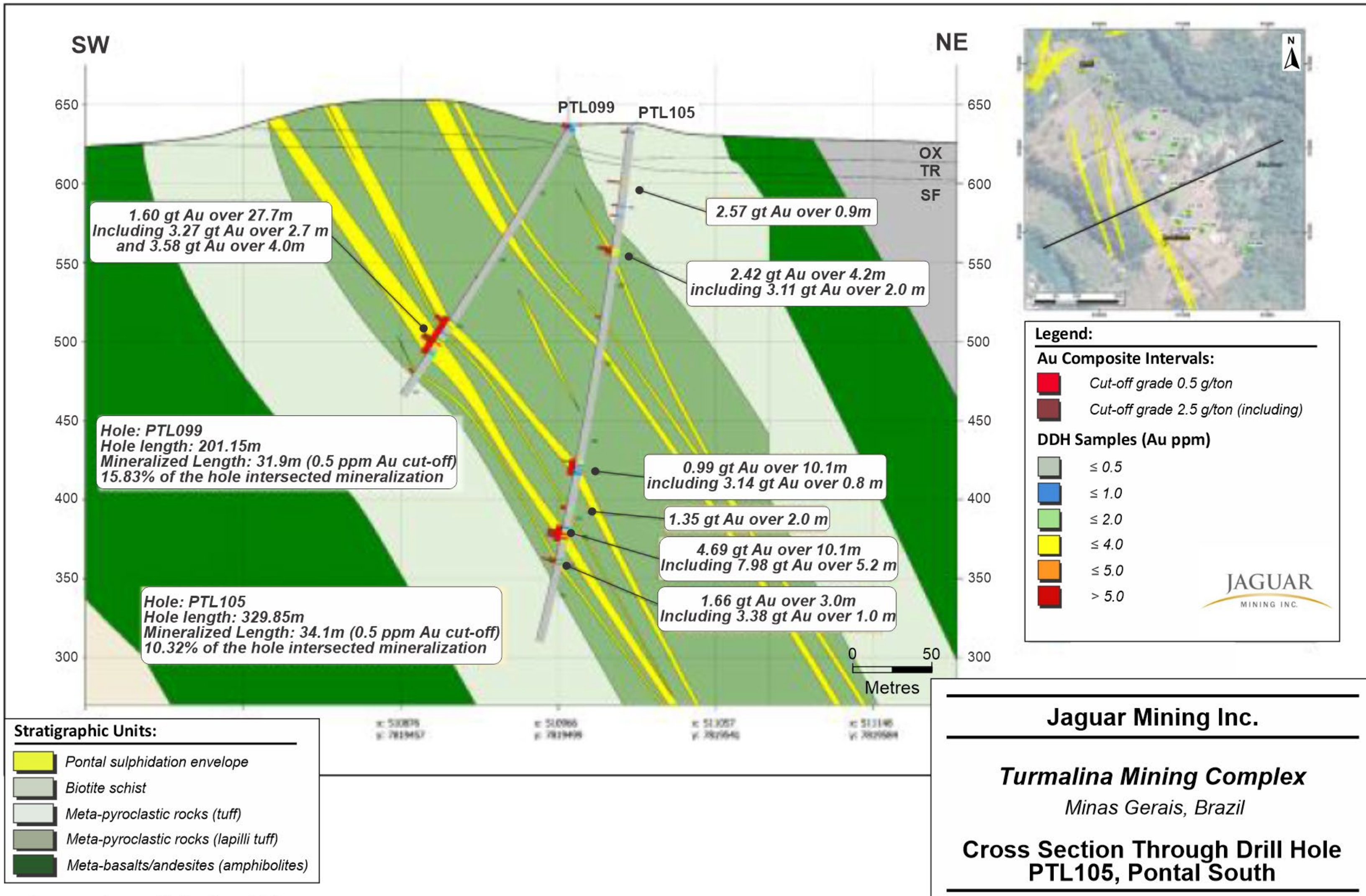
Hole ID	From (m)	To (m)	Downhole Interval (m)	Grade (g/t Au)
Including	*58.00*	*62.00*	*4.0*	*6.30*
PTL096	115.70	120.45	4.75	2.82
Including	*118.75*	*120.45*	*2.00*	*4.95*
PTL096	126.85	136.00	9.15	2.59
Including	129.00	131.00	2.00	5.08
PTL096	151.35	159.35	8.00	3.95
Including	152.40	156.50	4.10	5.05
PTL097	81.05	94.25	13.20	2.03
Including	*81.05*	*84.10*	*3.05*	*4.65*
PTL098	157.50	165.65	8.15	3.33
Including	*158.40*	*161.55*	*3.15*	5.41
PTL099	159.00	171.65	12.65	2.04
Including	*161.00*	*164.00*	*3.00*	*3.94*
PTL102	*161.00*	*171.35*	10.35	*2.77*
Including	167.70	171.35	3.65	*7.41*
PTL105	255.00	265.05	10.05	4.69
Including	258.00	263.15	5.15	7.98

Figure 10-5: Plan View of the Drill Hole Collars, Pontal South



Source: Jaguar Mining Inc., 2023.

Figure 10-6: Cross Section Through Drill Hole PTL105, Pontal South



Source: Jaguar Mining Inc., 2023.

10.5 Zona Basal

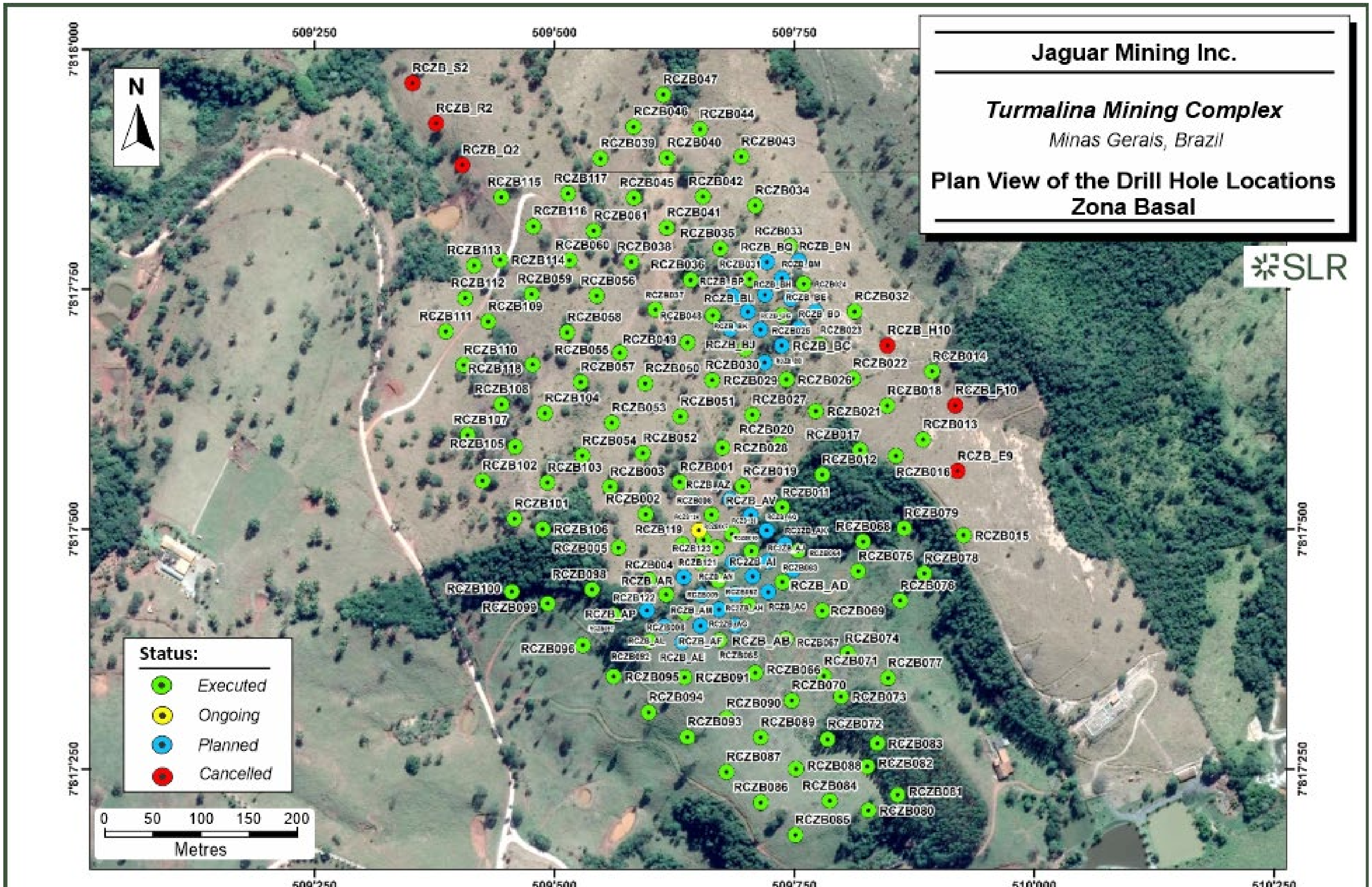
No drilling was carried out by Jaguar on the Zona Basal deposit in 2022 or 2023. Details regarding the results obtained from drilling campaigns completed by Jaguar on the Zona Basal deposit in late 2020 and 2021 have been presented in SLR (2022).

In brief, in late 2020 and early 2021, a total of 26 exploratory/reconnaissance diamond drill holes (totalling 3,830.8 m) were completed at the Zona Basal target. This reconnaissance drilling at the target initially focused on a program of wide-spaced holes following up and targeting near surface oxide and potential deeper, structurally controlled sulphide extensions to the greenstone bedrock gold intersections from surface trenching (both within the footprint, and along the margins of the extensive 100 ppb Au in soil anomaly).

In the second half (H2) of 2021, the initial reverse circulation (RC) drilling campaign commenced at the Zona Basal target. The RC drilling campaign targeted a shallow oxide initial resource within the surface exposure and shallow supergene (oxide-saprolite) regolith profile within a central area which extends approximately 1,000 m along strike by 200 m width (across strike) and to a depth of 30 m to 50 m. As part of this initial RC drilling campaign, a total of 119 RC holes to an average depth of 50 m (totalling 6,751 m) were completed along a 50 m x 50 m grid pattern. By December 2021, a more localized and supplementary RC campaign, on a 25 m x 25 m ultimate grid pattern, was also completed focusing on two of the more promising individual areas. This drill program included 43 drill holes totalling 2,120 m.

The locations of all drill holes completed at the Zona Basal Deposit are presented in Figure 10-7. The drill holes presented in Figure 10-7 reflect the status as of the end of the 2021 drill program, and no additional holes have been drilled since.

Figure 10-7: Plan View of the Drill Hole Locations, Zona Basal Deposit



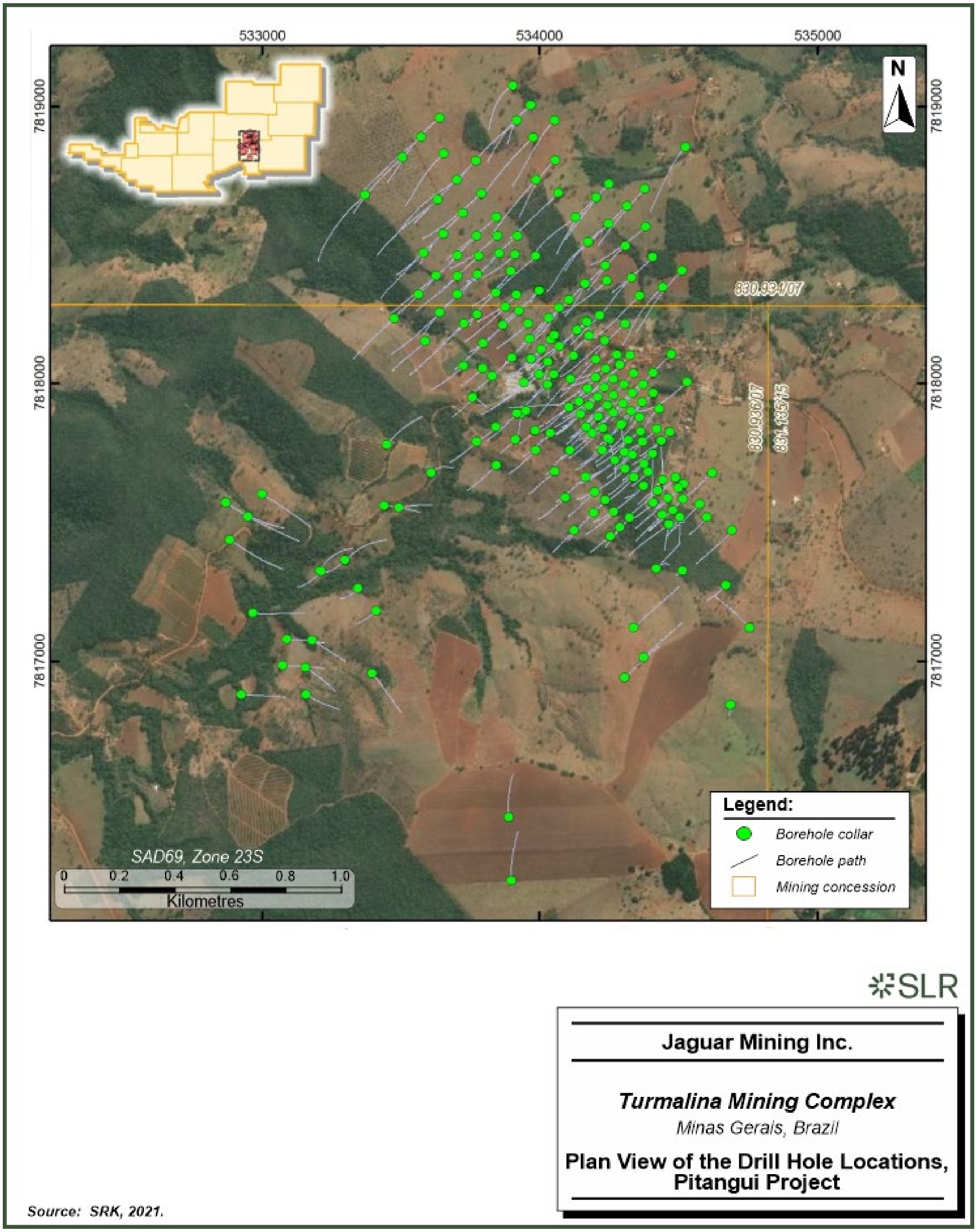
Source: Jaguar Mining Inc., 2023.

10.6 Pitangui Project

As the Pitangui Project was acquired in September 2023 by Jaguar, no drilling has been completed by Jaguar on the Pitangui Project as of the effective date of this report. IAMGOLD drilled a total of 240 core boreholes (approximately 88,034 m) at the São Sebastião deposit between 2011 and 2019, as summarized in Table 10-1. Figure 10-8 illustrates the drill hole locations at the São Sebastião deposit.

Additional details relating to drilling at the Pitangui Project can be found in Section 9 of the Preliminary Economic Assessment for the Pitangui Gold Project prepared by SRK on behalf of IAMGOLD (SRK, 2021).

Figure 10-8: Plan View of the Drill Hole Locations, Pitangui Project



Source: SRK, 2021.

11.0 Sample Preparation, Analyses, and Security

11.1 Sampling

The sample collection and preparation procedures used by Jaguar are provided in the subsections below. The sample preparation and analytical procedures employed by IAMGOLD at Pitangui are described by SRK (2014) for the period between 2009 and 2014, and by SRK (2021) for the period from 2015 to 2019.

11.1.1 Surface/Exploration Channel Sampling

- Channel samples are regularly collected from outcrops and trenches.
- The sites to be sampled are cleaned with a hoe, exposing the material by scraping it.
- Structures are mapped and the lithologic contacts defined, and samples marked so that no sample has more than one lithology.
- Samples have a maximum length of one metre and are from one kilogram to two kilograms in weight.
- Each sample is collected manually in channels with average widths between five centimetres and ten centimetres, and about three centimetres deep, using a hammer and a chisel.
- Either an aluminum tray or a thick plastic canvas drop sheet is used to collect the material.
- The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified by small aluminum plates, labels, or small wooden poles.
- Sketches are drawn with lithological and structural information. The sample locations are then surveyed and are entered into the master database.

11.1.2 Diamond Drilling Core Sampling

- Surface drilling is performed by contractors with holes in HQ or NQ diameters.
- Underground drilling was performed either by Jaguar or contractors with NQ, BQ, or LTK core diameters.
- Drill holes are accepted only if core recovery from the mineralized zone exceeds 85%.
- All the drill holes have their deviations measured by a Reflex Gyro TM or an equivalent surveying tool.
- The cores are stored in wooden boxes of one metre length, and with three metres of core per box (HQ and NQ diameter) or with four metres of core per box (BQ or LTK diameters).
- The code number, length, and location of each hole are identified in the boxes by an aluminum plate or by a water-resistant ink mark in front of the box.
- The progress intervals and core recoveries are identified inside the boxes using aluminum plates that show the data, attached to small wooden blocks.

- During logging, all geological information and the recovery measurements are verified and the significant intervals for sampling are defined.
- Individual samples are identified in the boxes by highlighting/labeling their numbers at the edges of the wood boxes.
- Core samples are cut lengthwise into approximately equal halves, with the use of a diamond saw.
- The half core sample for analysis is placed in a highly resistant plastic bag, identified by a label, and the other half is kept in the box at an offsite secure location close to the mine.
- For the shorter-length, bazooka-type drill holes completed from underground set-ups (the LM-series drill holes), the whole core is sampled as the core diameter does not permit splitting into halves.

11.1.3 Underground Production Channel Sampling

- The sector of wall to be sampled is cleaned with pressurized water. Structures are mapped and lithologic contacts defined, and samples marked with boundaries at lithology contacts. Samples have a maximum length of one metre and are from two to three kilograms in weight.
- Channel samples were collected by manually opening the channels, using a hammer and a little steel pointer crowned by carbide or a small jackhammer.
- The channel samples have lengths ranging from 50 cm to one metre, average widths between five centimetres and ten centimetres, and about three centimetres deep.
- Two sets of channel samples on the face are regularly collected. One set of channel samples are collected from the top of the muck pile once the work area has been secured. The second set of channel samples are collected at waist height once the heading has been mucked clean and secured.
- At approximately five metre intervals, the walls and back are sampled by channel sampling. The channel samples are collected starting at the floor level on one side and continue over the drift back to the floor on the opposite side.
- Either an aluminum tray or a thick plastic canvas is used to collect the sample material. The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified by small aluminum plates, labels, or small wooden poles.
- Sketches are drawn with lithological and structural information. The sample locations are then surveyed and are entered into the master database.

11.2 Sample Preparation and Analysis

For exploration drill holes prior to 2016, samples were prepared and analyzed at the SGS Geosol Laboratory in Belo Horizonte. From 2016 onwards, exploration samples from auger, drill holes, chip, and RC drilling were analyzed at Jaguar's onsite Caeté laboratory to quickly determine grades, and by the ALS laboratory, located in Belo Horizonte, for the official grades and assay certificate. These duplicate assays allowed for quality control checks of the onsite laboratory.

The ALS and SGS Geosol laboratories are independent of Jaguar and meet international analytical standards and ISO 17025 compliance protocols.

For in-fill drill holes and channel samples collected prior to 2015, samples were prepared at Jaguar's Caeté laboratory by drying, crushing to 90% minus 2 mm, quartering with a Jones splitter to produce a 250 g sample, and pulverizing to 95% minus 150 mesh. Analysis for gold was by standard fire assay procedures, using a 50 g or 30 g sample with an atomic absorption (AA) finish.

All samples from 2015 onwards are analyzed at Jaguar's Caeté laboratory according to the following workflow. A one kilogram sub-sample of the crushed material is selected for pulverization to approximately 70% minus 200 mesh. The ring-and-puck pulverisers are cleaned after each sample using compressed air and a polyester bristle brush. The analytical protocol for all samples employs a standard fire assay fusion using a standard 30 g aliquot, with the final gold content being determined by means of AA. The detection limit for fire assay analyses is 0.05 g/t Au. A second cut from the pulps is collected and re-assayed for those drill core samples where the grade is found to be greater than 30 g/t Au. If the two assays are in good agreement, only the first assay is reported. The AA unit is calibrated to directly read gold grades up to 3.3 g/t Au; samples with grades greater than this are re-assayed by diluting the solute until it falls within the direct-read range.

Turmalina Mine has a process control laboratory that analyzes the shifts and plant samples.

The SLR QP has reviewed the field and underground sampling procedures and is of the opinion that they meet accepted industry standards. In the SLR QP's opinion, the sample preparation, analysis, and security procedures at the Turmalina Complex are adequate for use in the estimation of Mineral Resources.

11.3 Quality Assurance and Quality Control

The geology team at the Complex has carried out a Quality Assurance and Quality Control (QA/QC) program over the past years that has monitored the analytical results of samples from the diamond drilling program.

In total, 1,394 blank samples and 799 samples of Certified Reference Materials (CRM) were inserted into the sample stream in 2020 and 2021. Approximately 5% of pulps from the 2020 to 2021 drilling program has been sent to an external laboratory for duplicate analysis. These controls, blanks, and CRM samples were sent to and analyzed at Jaguar's onsite Caeté and ALS laboratories. SLR examined the QA/QC results for blanks and CRM samples for the 2022 and 2023 period and found that the results were of high quality and satisfactory for use in the preparation of Mineral Resource estimates.

Commercially sourced CRMs obtained from Rocklabs are inserted by the Turmalina geological team into their sample stream at a frequency of one every 45 to 50 samples. A list of the CRMs that were used is provided in Table 11-1. A sample CRM control chart is presented in Figure 11-1 and a sample blank control chart is presented in Figure 11-2.

Table 11-1: List of Certified Reference Materials, 2023 QA/QC Programs

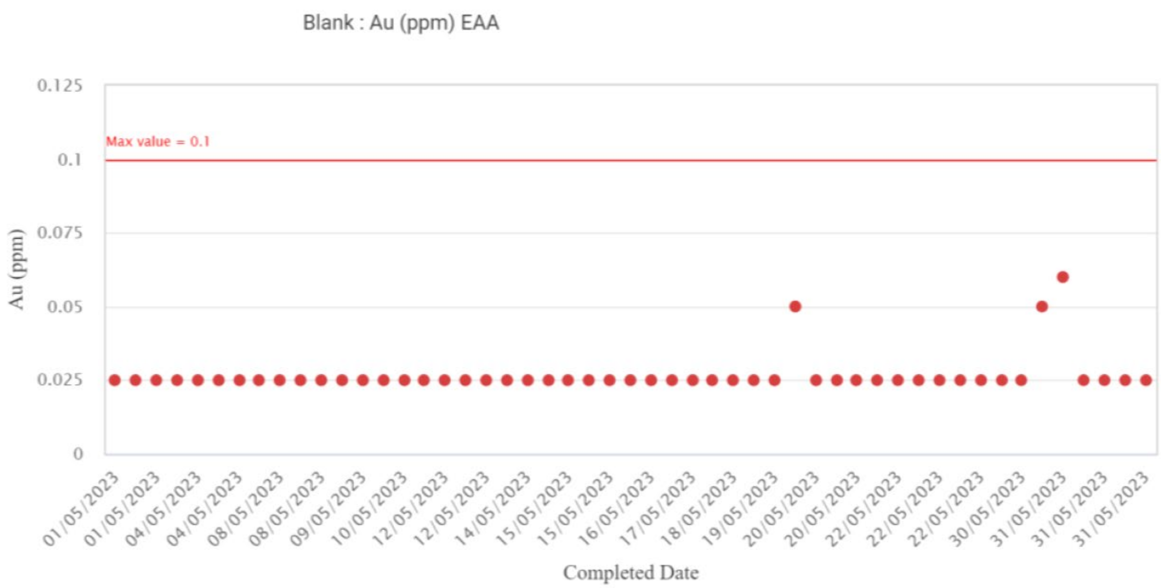
Standard No.	Number Analyzed (UG Drilling)	Number Analyzed (Surface Drilling)
Turmalina Mine		
SG113	7	-

SK120	25	-
HiSilK6	15	18
Si81	36	28
Faina Deposit		
Si81	-	47
SK120	-	727
HiSilK6	-	61
SG113	-	63
SG99	-	12
Pontal Deposit		
SK120	-	110

Figure 11-1: Sample Control Chart for Certified Reference Material Si81, May 2023

Source: Jaguar, 2023

Figure 11-2: Sample Control Chart for Blank Samples, May 2023



Source: Jaguar, 2023

Blank samples are inserted at a rate of one in every 20 samples, representing an insertion frequency of 5%. Blank samples are composed of crushed, barren quartzite or gneiss and are used to check for contamination and carry-over during the crushing and pulverization stage.

The results of the blanks and standards are forwarded to Jaguar's head office monthly for insertion into Jaguar's internal database (referred to as the M database). The results from the standards samples are scanned visually for out-of-range values on a regular basis. When failures are detected, a request for re-analysis is sent to the laboratory. Only those assays that have passed the validation tests are accepted into the main database.

The Caeté laboratory carried out an internal, separate, and distinct program of QA/QC for all drill core samples and channel samples as well. This involves conducting monthly monitoring checks at the SGS/GEOSOL Laboratory. In total, the Caeté laboratory analyzed 1,382 blank samples for Turmalina Mine for the January 2020 to December 2021 period. Jaguar did not carry out duplicate sample analyses on samples collected between 2020 and 2023. SLR recommends that Jaguar modify their QA/QC program to include duplicate assaying using sample pulps.

In the SLR QP's opinion, the QA/QC program as designed and implemented by Jaguar is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

11.4 Pitangui

The following has been excerpted from SRK (2021).

"Exploration samples collected by IAMGOLD personnel between 2009 and April 2015 were submitted to ACME analytical laboratories (ACME) in Goiânia and Vespasiano, Brazil, currently operating as Bureau Veritas Mineral Laboratories. Exploration samples collected between April 2015 and June 2019 were submitted to ALS Brasil Ltda (ALS) in Vespasiano, Brazil. Both facilities are independent, commercial geochemical laboratories that operated independently from IAMGOLD.

No further exploration sampling has been conducted by IAMGOLD since June 2019.

SRK recommends limiting the number of specific certified reference materials used for gold analysis for low, medium and high-grade categories in order to accurately monitor laboratory trends in quality control results. In the opinion of SRK, the sampling preparation, security and analytical procedures used by IAMGOLD are consistent with generally accepted industry best practices and are, therefore, adequate for an advanced exploration project."

SLR has reviewed the information presented in SRK (2021), and in the opinion of the SLR QP, the QA/QC program was adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

12.0 Data Verification

SLR conducted data verification checks on the Turmalina Mine, Faina Deposit, Pontal Deposits, Zona Basal Deposit, and São Sebastião deposit at the Pitangui Project. These five deposits comprise the MTL Complex, supporting the Mineral Resource estimate. These checks included on-site visits to inspect gold mineralization and host rocks, assessments of Jaguar's assay laboratory, and field inspections for ore control, geological mapping, drilling, and mining activities. Independent validations were performed on various drill hole databases, including spot checks on specific drill holes intersecting significant gold mineralization. Checks also covered collar locations, drill hole and sample orientations, geological wireframes, and excavation models. SLR considers the drilling and sampling databases at the Turmalina Mine, Faina Deposit, Pontal Deposits, Zona Basal, and Pitangui Project suitable for use in preparing Mineral Resource and Mineral Reserve estimates.

As a matter of housekeeping, SLR recommends that Jaguar include a field for the sample identification number for all assay data exports from the primary database to the individual software packages being used to complete the Mineral Resource estimates.

12.1 Turmalina Mine

The validation checks for the Turmalina Mine drilling and sampling database, provided by Jaguar and conducted by the SLR QPs in support of the 2023 Mineral Resource estimate, involved the following:

- Conducted site visits in 2014, 2017, and 2022 to personally inspect the style and structural complexity of the gold mineralization and its host rocks.
- Carried out site visits to the Jaguar assay laboratory on two occasions where the sample preparation and analytical procedures and equipment were reviewed.
- During the visits, fieldwork inspections were conducted to oversee various aspects such as ore control, geological mapping, drilling, mining activities, and the collection of auger samples.
- Carried out independent validation of the 2015, 2016 and 2018 drill hole databases as described in RPA (2016, 2017 and 2018).
- Carried out independent validation of the drill hole databases:
    - Compiled all certificates provided (36,616 analytical samples in total) using python scripts and compared values for Au against a subset of drill hole database assay table comprising 54,109 samples between 2019 and 2023 (67% of samples analyzed during this period).
    - Compiled certificates span drilling programs conducted between 2020 and 2022.
    - Carried out cross-checks between the assay database and the provided certificates in .pdf, .xls and .csv format obtained from two laboratories: ALS Chemex. (14,702 samples), and Jaguar’s onsite Caeté laboratory (15,321 samples).
    - The comparison identified discrepancies between the drill hole database and the analytical certificates. However, SLR anticipates errors can be corrected with remedial action resulting in no material impact to estimated Mineral Resources.

The SLR QP recommends that Jaguar enhance its procedures for excluding analytical values tied to reference materials, particularly those originating from Jaguar's onsite Caeté laboratory, before incorporating new assay results into the final drill hole database.

- Checked collar locations relative to either the digital topographic surface or the location of the underground excavation digital model as appropriate.
- Reviewed drill hole and sample orientations (azimuth/dip) relative to the location of the mineralized zones.
- Completed validity checks for out-of-range values, overlapping intervals, and mismatched sample intervals.
- Reviewed the geological wireframes to ensure that a minimum mining width was honoured.
- Reviewed the coding of the mined out material in the block model to ensure a reasonable match with the excavation model.

No significant errors were noted for the collar, survey, lithology, or assay records reviewed. The SLR QP did observe some minor discrepancies on the order of one metre between the location of the collars of some underground-based drill holes and the excavation models. These discrepancies are likely due to survey errors in the determination of either the drill hole collars or the excavation models and may contribute to errors in the mine design and excavation phases of the mining operation. The SLR QP recommends that Jaguar continue to carry out regular reviews of its surveying practices and quality control procedures to ensure that all drill hole collars are accurately located prior to entry into the final drill hole database.

The surface and underground drill hole collar locations are reasonable and channel samples are appropriately located with respect to the existing underground infrastructure.

The SLR QP is of the opinion that the drilling and sampling database is appropriate to be used in the preparation of Mineral Resource and Mineral Reserve estimates.

12.2 Faina Deposit

The validation checks for the Faina deposit drilling and sampling database, provided by Jaguar and conducted by the SLR QPs in support of the 2023 Mineral Resource estimate, involved the following:

- Carried out independent validation of the drill hole databases:
    - Compiled all certificates provided (10,765 analytical samples in total) using python scripts and compared values for Au against the drill hole database assay table 53,340 samples (~20% of the database).
    - Compiled certificates span drilling programs conducted between 2021 and 2022.
    - Carried out cross-checks between the assay database and the provided certificates in .pdf, .xls and .csv format obtained from two laboratories: ALS Chemex. (10,196 samples), and Jaguar’s onsite Caeté laboratory (569 samples).
    - The comparison identified discrepancies between the drill hole database and the analytical certificates. However, SLR anticipates errors can be corrected with remedial action resulting in no material impact to estimated Mineral Resources.
- Checked collar locations relative to the digital topographic surface.

- Reviewed drill hole and sample orientations (azimuth/dip) relative to the location of the mineralized zones.
- Completed validity checks for out-of-range values, overlapping intervals, and mismatched sample intervals.
- Reviewed the reasonableness of the geological interpretations relative to geological logging.
- Reviewed the geological wireframes to ensure that a minimum mining width was honoured.

No significant errors were noted for the collar, survey, lithology, or assay records reviewed.

The SLR QP is of the opinion that the drilling and sampling database is appropriate to be used in the preparation of Mineral Resource estimates.

12.3 Pontal Deposits

The validation checks for the Pontal South deposit drilling and sampling database, provided by Jaguar and conducted by the SLR QPs in support of the 2023 Mineral Resource estimate, involved the following:

- Carried out independent validation of the drill hole databases:
  - Compiled all certificates provided (5,381 analytical samples in total) using python scripts and compared values for Au against 3,605 samples of the 5,285 samples within the drill hole database assay table (68% of the database).
  - Compiled certificates span drilling programs conducted between 2021 and 2022.
  - Carried out cross-checks between the assay database and the provided certificates in .pdf, .xls and .csv format obtained from two laboratories: ALS Chemex. (4,765 samples), and Jaguar's onsite Caeté laboratory (616 samples).
  - The comparison identified discrepancies between the drill hole database and the analytical certificates. However, SLR anticipates errors can be corrected with remedial action resulting in no material impact to estimated Mineral Resources.
- Checked collar locations relative to the digital topographic surface.
- Reviewed drill hole and sample orientations (azimuth/dip) relative to the location of the mineralized zones.
- Completed validity checks for out-of-range values, overlapping intervals, and mismatched sample intervals.
- Reviewed the reasonableness of the geological interpretations relative to geological logging.
- Reviewed the geological wireframes to ensure that a minimum mining width was honoured.

No significant errors were noted for the collar, survey, lithology, or assay records reviewed.

The SLR QP is of the opinion that the drilling and sampling database is appropriate to be used in the preparation of Mineral Resource estimates.

12.4 Zona Basal

The validation checks for the Zona Basal deposit drilling and sampling database, provided by Jaguar and conducted by the SLR QPs in support of the 2023 Mineral Resource estimate, involved the following:

- Carried out independent validation of the drill hole databases:
  - Compiled all certificates provided (10,242 analytical samples in total) using python scripts and compared values for Au against 10,029 samples of the 13,905 samples within the drill hole database assay table (72% of the database).
  - Compiled certificates span drilling programs conducted between 2021 and 2022.
  - Carried out cross-checks between the assay database and the provided certificates in .pdf, .xls and .csv format obtained from two laboratories: ALS Chemex. (10,124 samples), and Jaguar's onsite Caeté laboratory (118 samples).
  - The comparison identified discrepancies between the drill hole database and the analytical certificates. However, SLR anticipates errors can be corrected with remedial action resulting in no material impact to estimated Mineral Resources.
- Checked collar locations relative to the digital topographic surface.
- Reviewed drill hole and sample orientations (azimuth/dip) relative to the location of the mineralized zones.
- Completed validity checks for out-of-range values, overlapping intervals, and mismatched sample intervals.
- Reviewed the reasonableness of the geological interpretations relative to geological logging.
- Reviewed the geological wireframes to ensure that a minimum mining width was honoured.

No significant errors were noted for the collar, survey, lithology, or assay records reviewed.

The SLR QP is of the opinion that the drilling and sampling database is appropriate to be used in the preparation of Mineral Resource estimates.

12.5 Pitangui Project

The validation checks for the Pitangui Project drilling and sampling database, provided by Jaguar and conducted by the SLR QPs in support of the 2023 Mineral Resource estimate, involved the following:

- Carried out independent validation of the drill hole databases
  - Compiled all certificates provided (36,616 analytical samples in total) using python scripts and compared values for Au against the drill hole database assay table 36,616 samples (100% of database).
  - Compiled certificates span drilling programs conducted between 2011 and 2019.
  - Carried out cross-checks between the assay database and the provided certificates in .pdf, .xls and .csv format obtained from two laboratories: ACME Laboratories Ltd. (21,471 samples), and ALS (15,145 samples).

  - All initial discrepancies between the drill hole database and the analytical certificates. were deemed acceptable, as they stemmed from the re-assaying of sample batches. The database consistently prioritizes the most recent sample results chronologically, with re-assayed batches superseding the original assay values.
- Checked collar locations relative to the digital topographic surface.
- Reviewed drill hole and sample orientations (azimuth/dip) relative to the location of the mineralized zones.
- Completed validity checks for out-of-range values, overlapping intervals, and mismatched sample intervals.
- Reviewed the reasonableness of the geological interpretations relative to geological logging and ICP multielement assays.
- Reviewed the geological wireframes to ensure that a minimum mining height was honoured.
  - SLR observed that pinch-outs were applied to mineralization wireframes, resulting in wireframe thicknesses less than 2 m in height. SLR used stope optimization panels to report the areas with heights less than 2 m, applying a 2 m minimum mining height.

No significant errors were noted for the collar, survey, lithology, or assay records reviewed.

The SLR QP is of the opinion that the drilling and sampling database is appropriate to be used in the preparation of Mineral Resource estimates.

13.0 Mineral Processing and Metallurgical Testing

13.1 Introduction

Historical metallurgical test work programs and results were previously reported (Hill and Tomaselli, 2020). The SLR QP reviewed the following data provided by Jaguar:

- Reports related to recent metallurgical test work programs.
- Historical mill production and recovery data
- The metallurgical recoveries used for estimating Mineral Resources in this Technical Report are based primarily on historical operating data.

13.2 Turmalina Mine Metallurgical Tests

Test work programs were performed in 2020 and 2022 to support current operations and potential improvements, including:

- TESTWORK Desenvolvimento de Processo Ltda. (TDP), located in Nova Lima, Minas Gerais, Brazil:
  - Metallurgical studies were completed with samples of material from Orebody A, B, C-Central (CC), C Lavra, CSE, and C8. The test work (the TDP-MTL Test Program) included chemical and mineralogical characterization, comminution, gravity concentration, and cyanidation (TDP, 2020).
- Jaguar Mining Inc., Process Laboratory (JPL), located in Caeté, Minas Gerais, Brazil:
  - Leaching of Turmalina ore samples from Orebody CNW (Barros, 2021a)
  - Cyanide leaching of miscellaneous Turmalina mine samples (Barros, 2021b)
  - Study of gravity concentration and cyanidation for plant circuit metallurgy (Barros, 2021c)
  - Cyanidation of ore samples from Orebody A and C (Barros, 2022).

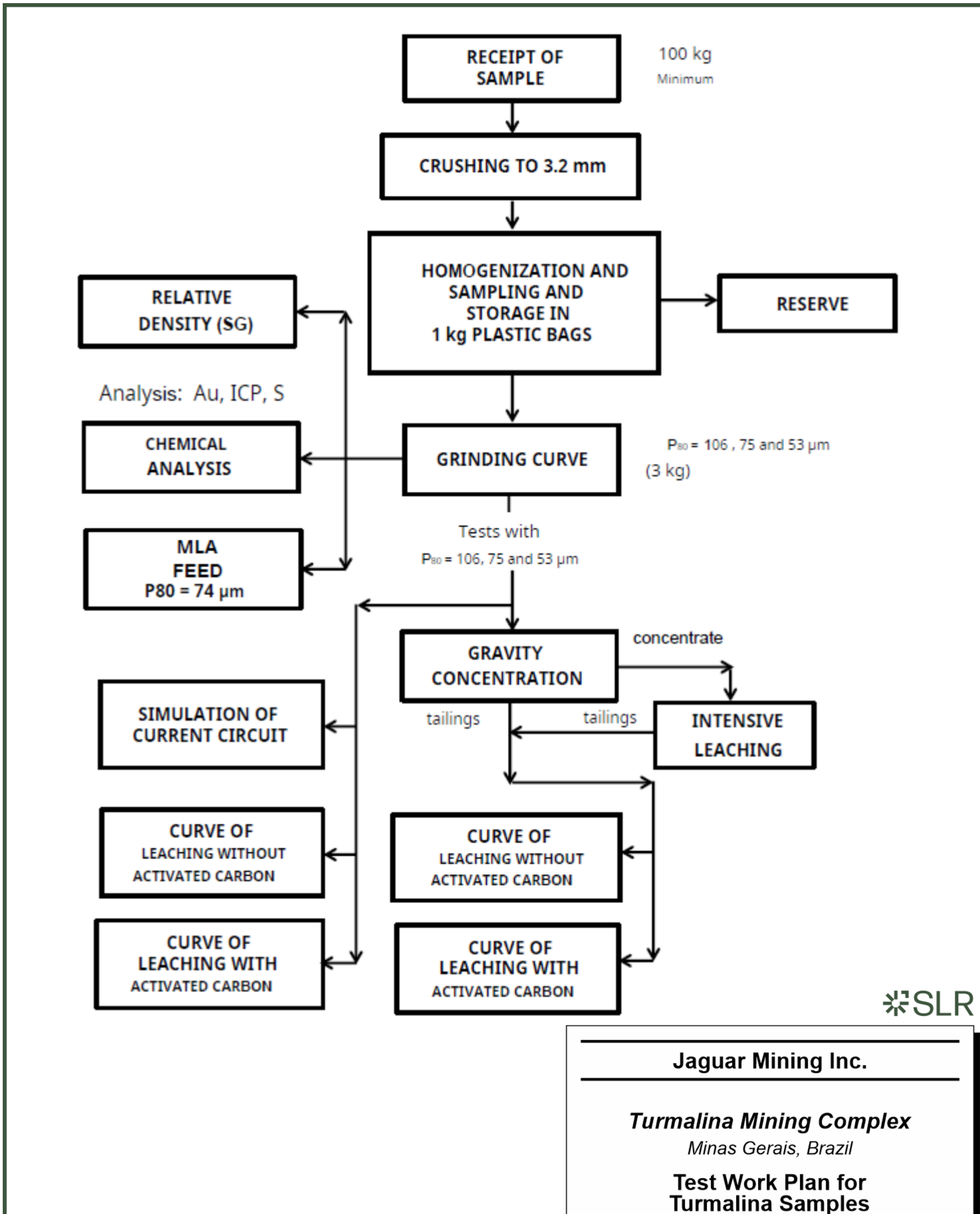
13.2.1 TDP-MTL Test Program

In 2020, external laboratory test work was conducted by TDP on samples of material received from the Turmalina Mine (Orebody A, B, CC, C Lavra, CSE, and C8). The objectives of the work were as follows:

- To determine the expected gold recovery when processing materials from different ore bodies
- To identify any requirements for circuit changes, due to new ore characteristics
- To identify opportunities to optimize existing processes.

A general test plan was systematically followed for all samples (TDP, 2020) and is illustrated in the schematic shown in Figure 13-1. The test plan included sample preparation, crushing, grinding, chemical and mineralogical analysis, gravity concentration, intensive leaching, simulation of the current plant circuit, and leaching. TDP confirmed the representativeness of the ore samples provided by Jaguar for testing. The key results, as summarized in the TDP (2020), are presented in Figure 13-2 through Figure 13-6.

Figure 13-1: Test Work Plan for Turmalina Samples



Source: TDP, 2020.

Figure 13-2 compares the gold head grades of the analyzed samples and the average of all head grades recalculated from all the leach tests.

Figure 13-2: Gold Grade of the Samples

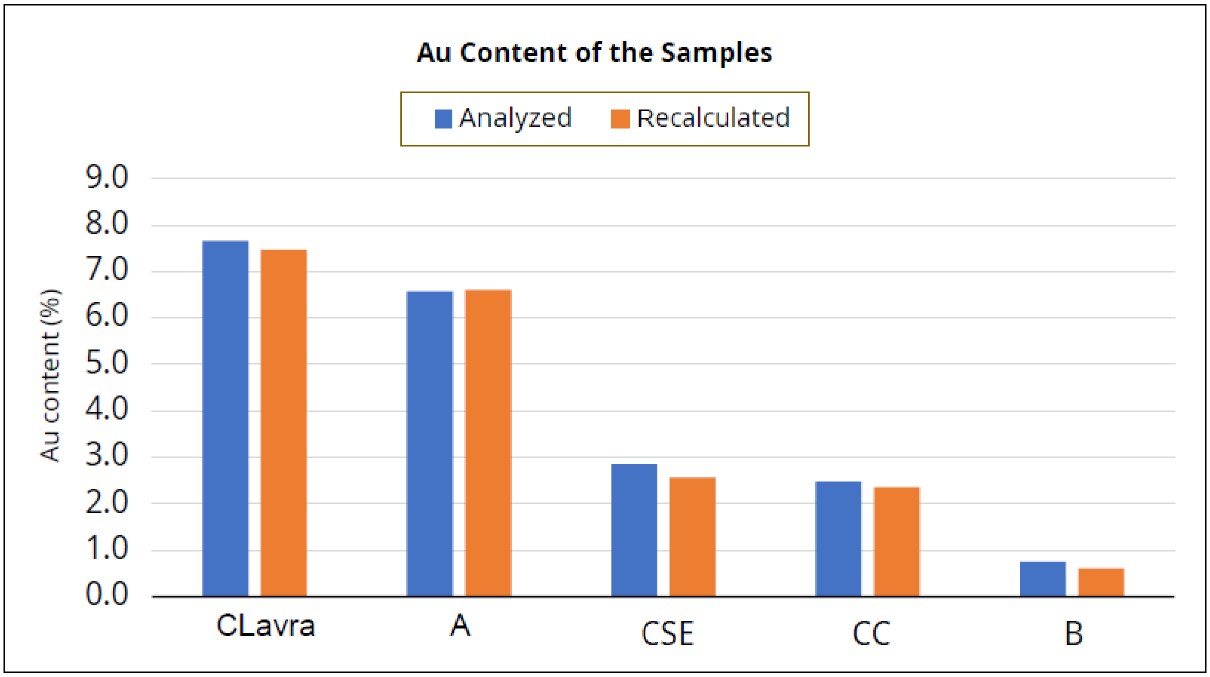
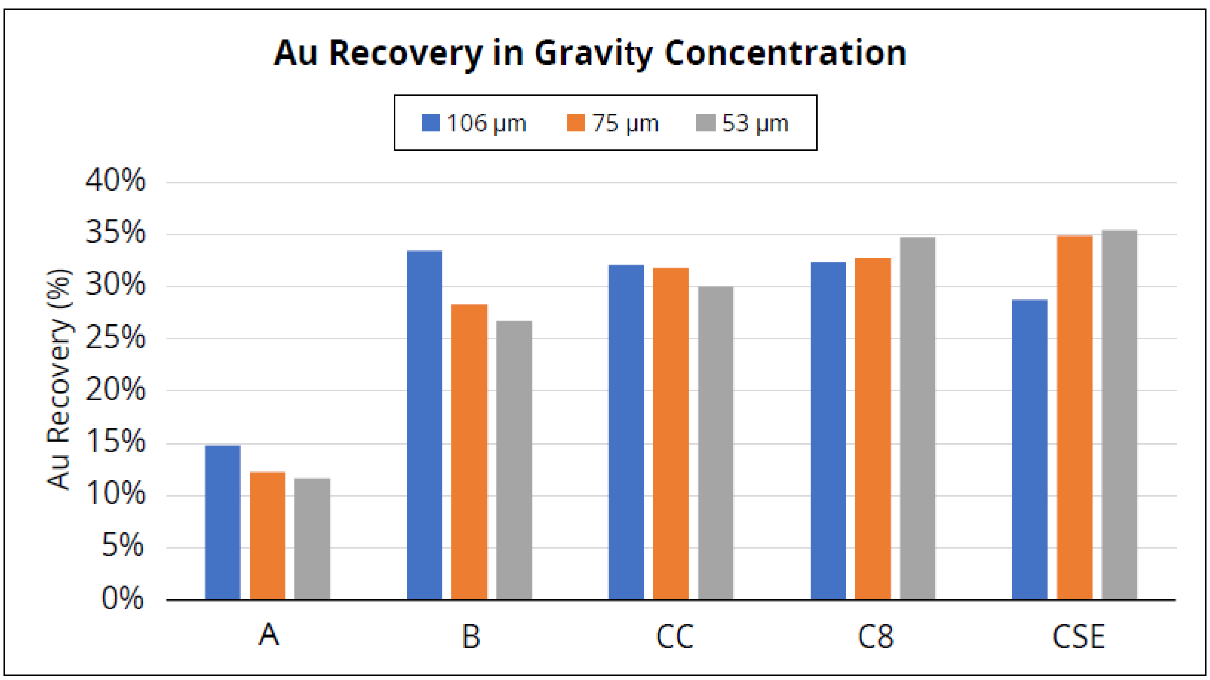


Figure 13-3 depicts the averages of all gravity concentration test results performed prior to the leaching tests.

Figure 13-3: Gold Recovery in Gravity Concentration



Leaching tests were carried out simulating a CIL circuit (as the Turmalina Plant has the potential to use this type of circuit) and the current circuit. From the leach tests, the overall averages of gold recovery and gold recovery to tailings are shown in Figure 13-4 and Figure 13-5.

Figure 13-4: Gold Recovery Under Leaching Conditions

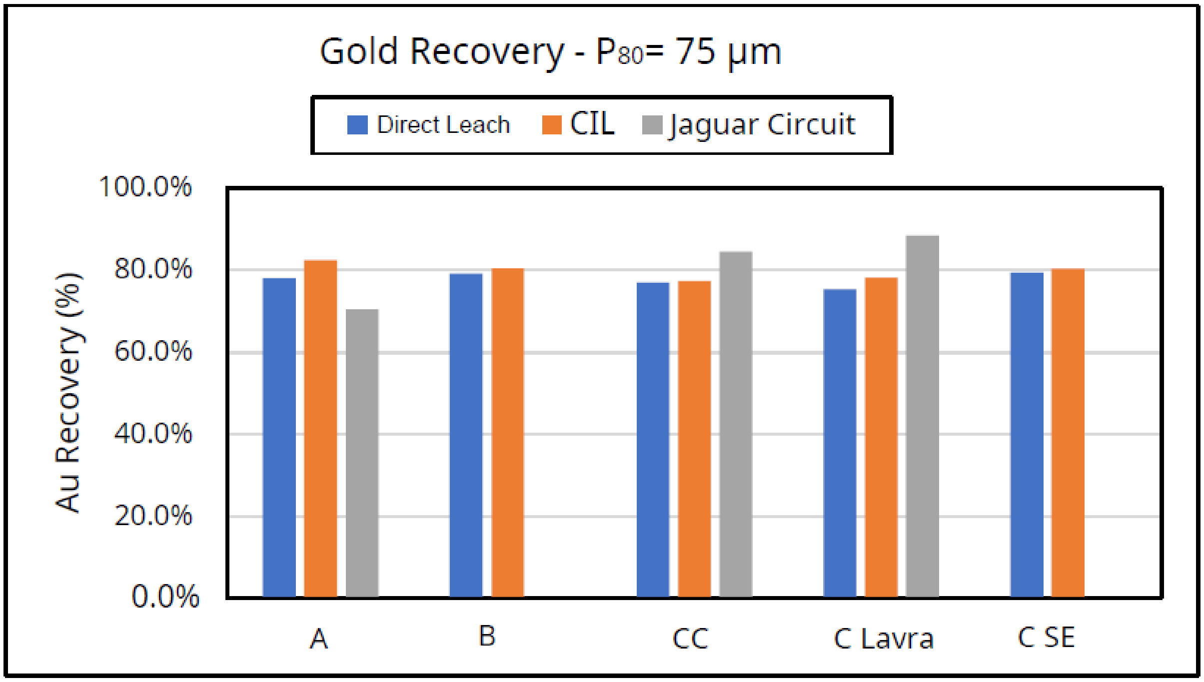
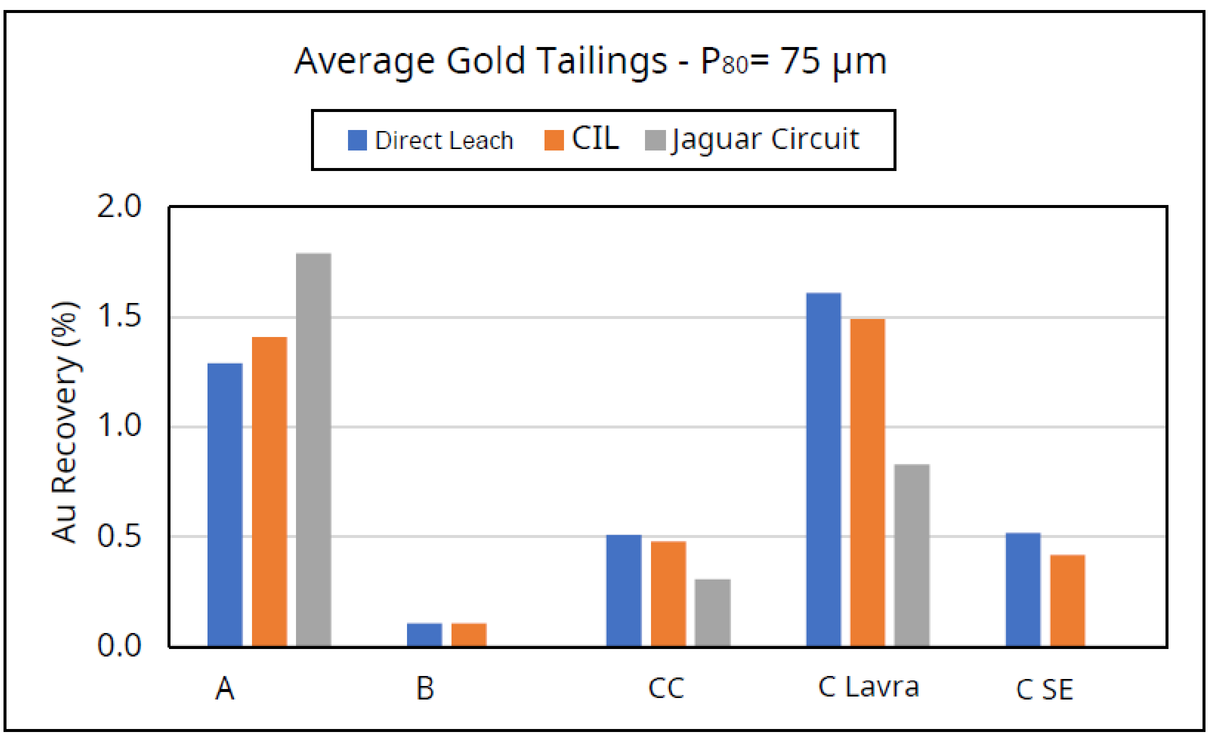
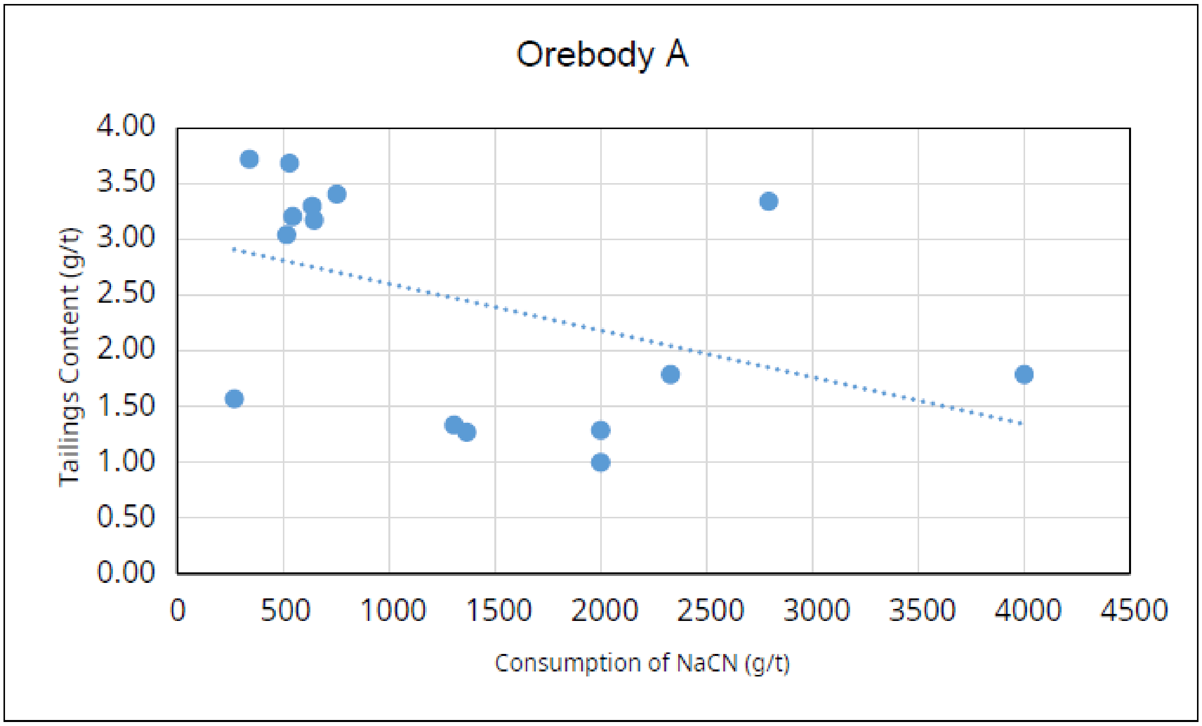


Figure 13-5: Gold Recovery to Tailings Under Leaching Conditions



TDP observed that the sample from Orebody A exhibited a different behaviour in testing and that the recovery is dependent on the consumption of cyanide, as illustrated in Figure 13-6.

Figure 13-6: NaCN Consumption v. Tailings Gold Grade for Orebody A



Initial tests support further study, using plant samples, of exchanging the current circuit for a CIL circuit with a shorter contact time. The exchange could lead to a reduction in energy costs (for compressed air and agitators) and a reduction in the number of elution steps. TDP reported that gravity concentration did not show any advantage in laboratory tests, however, in practice, gravity concentration can stabilize the content of the leach feed and reduce the amount of gold in tailings.

13.2.1.1 Conclusions

TDP (2020) concluded that:

- Turmalina ores were not refractory, but they were different from each other and needed to be studied in advance to optimize recovery in the Turmalina Plant.
- Gravity concentration can provide advantages.
- A CIL circuit can be studied to replace the current configuration.

13.2.2 JPL Test Programs

From 2021 to 2022, the following internal laboratory test work programs were undertaken by JPL on Turmalina feeds:

- Leaching of ore samples from Orebody CNW (Barros, 2021a)
- Cyanide leaching of miscellaneous ore samples (Barros, 2021b)
- Study of gravity concentration and intensive leaching (Barros, 2021c)

- Cyanidation of ore samples from Orebody A and C (Barros, 2022).

Barros reported standardized test conditions being followed to replicate the Turmalina Plant conditions in both sample preparation and laboratory testing, however, SLR could not confirm the representativeness of the ore samples collected for testing due to the limited sample information and description. A head sample was collected for gold analysis and the leaching tests were performed in duplicates according to the standard conditions shown in Table 13-1 (Barros, 2021a, 2021b, and 2022). In all tests the concentration of cyanide, dissolved oxygen, gold in solution, and pH were monitored. A brief description of each of the test work programs and the key results are summarized in the sub-sections below.

Table 13-1: Leaching and Adsorption Test Conditions

Phases	Condition 1	Condition 2	Condition 3	Condition 4
Pre-lime				
Lead nitrate dosage	-	30	30	-
%Solids	50	50	50	-
pH	9	8.5	8.5	-
Residence time (h)	4	12	12	-
Alkaline Pre-lime				
Lead nitrate dosage	-	-	-	30
%Solids	-	-	-	50
pH	-	-	-	10.5
Residence time (h)	-	-	-	12
Leaching				
pH	10.3	10.5	10.5	10.5
Cyanide concentration (ppm)	300	350	500	350
Residence time (h)	23.5	12	12	12
Adsorption				
pH	10.3	10.5	10.5	10.5
Cyanide concentration (ppm)	300	350	350	350
Residence time (h)	9	24	24	24

13.2.2.1 Leaching of Orebody CNW Samples

Because lower recoveries were observed during previous processing of Orebody CNW material, laboratory testing was conducted on ore samples to better understand leaching and adsorption behaviour (Barros, 2021a). Variables impacting the kinetics and recovery of the leach process were studied, including leaching time, lime addition, cyanide concentration during leaching, and percentage of solids. Based on the test work results, Barros concluded that the low grade of the Orebody CNW material (< 0.50 g/t) contributed largely to the low gold recovery. It was recommended that grade variability along the extension of Orebody CNW be evaluated and that representative samples be collected for future testing. The tests showed that a re-adjustment in the leaching route can provide improvements in circuit optimization and cost reduction (e.g., a reduction in leaching time from 24 hours to 12 hours could reduce cyanide consumption).

13.2.2.2 Leaching of Miscellaneous Samples

Laboratory cyanide leaching was conducted on five miscellaneous Turmalina ore samples labelled A132 NW BL02, A142 NW, CC 42 SE BL01, C 6 3 HW NW BL01, and D51 NW BL01 (Barros, 2021b). Variables impacting the kinetics and recovery of the leach process were studied, including leaching time, lime addition, and cyanide concentration during leaching. Based on the test work results, Barros' key conclusions were as follows:

Depending on orebody location, the Turmalina samples exhibit different leaching behaviour, may present refractory characteristics, and vary in cyanide consumption.

The standard conditions of leaching and adsorption for the Turmalina Plant did not prove to be the most suitable for maximum gold recovery for any of the test samples, indicating that there is an opportunity for process optimization. This performance was strongly associated with long leaching time which results in the coating of gold-containing particles by a stable layer of hydroxides and difficulty in gold solubilization.

Cyanide consumption in these samples was not related to the gold head grade. The presence of gangue minerals is a variable with the greatest influence on leaching.

Samples A132 NW BL02 and A142 NW showed very good response to cyanidation and gold recoveries above 92% were achieved.

Sample CC 42 SE BL01, although high in gold head grade (3.90 g/t to 5.09 g/t), showed refractory characteristics. Recoveries between 67% and 68% were achieved and the highest consumption of sodium cyanide (1.21 kg/t to 1.66 kg/t) was observed. It was reported that gold in this sample may include mineralogical phases that react strongly to cyanide.

Sample C 6 3 HW NW BL01 was lowest in gold head grade compared to the other samples. The recovery under different conditions was directly impacted by the variations in the recalculated gold head grade and the presence of gangue minerals in the sample.

Sample D51 NW BL01 showed large variations in the recalculated gold head grade that directly impacted gold recoveries (between 80% and 90%).

13.2.2.3 Gravity Concentration and Cyanidation Study

The application of gravity concentration and intensive leaching was studied as an alternative to the current Turmalina plant circuit (Barros, 2021c), which includes grinding, classification, thickening, leaching, and CIP. The presence of gravimetric gold has been studied by TDP and JPL and the addition of a gravimetric circuit before leaching was considered. Approximately 100 kg of mill feed sample was collected in October 2021 for laboratory testing of gravity concentration using a Falcon concentrator and intensive leaching tests. Based on the test work results, Barros concluded that gravity concentration resulted in a recovery of 29.84% and intensive leaching of the gravity concentrate was 87.28%. The overall recovery from gravity concentration, intensive leaching of the gravity concentrate, and cyanidation of the gravity tailing was between 82.94% and 88.68%. Conventional processing resulted in gold recoveries of 91.65% to 92.60%. It was recommended that a more detailed study should be carried out to assess the technical and financial feasibility of including gravity concentration and intensive leaching in the current plant flowsheet.

13.2.2.4 Cyanidation of Orebody A and C Samples

The objective of the study was to evaluate the leaching performance of ore samples from Orebody A and C and were labelled A 14-2 NW LD, A 14-346, and C62 NW 08 to 14 (Barros, 2022). Variables impacting the kinetics and recovery of the leach process were studied, including leaching time, lime addition, and cyanide concentration during leaching. Based on the test work results, Barros concluded that there were opportunities to increase metallurgical recovery for the samples tested through adjustment in the leaching and adsorption parameters, particularly a reduction in time for cyanidation. Regardless of the gold head grade, cyanide consumption was close to 1.0 kg/t, therefore, further work was recommended in order to reproduce the laboratory conditions in the process plant.

13.3 Faina, Pontal, and Orebody D Testing Programs

13.3.1 2009–2011 Oxide Mineralization Testing

In August 2009, direct cyanidation testing was performed by JPL on oxide mineralization from the Faina deposit. This cyanidation testing resulted in an average gold extraction of 96.1% on a sample of approximately 83% minus 200 mesh.

In August 2011, direct cyanidation testing was performed by JPL on oxide mineralization from the Orebody D target. The results indicate that the Orebody D target oxide mineralization is amenable to cyanidation.

In February 2010, direct cyanidation testing was performed by JPL on oxide mineralization from the Pontal deposits. The cyanidation testing resulted in an average gold extraction of 94.1%.

13.3.2 2008–2011 Sulphide Mineralization Testing

In May 2008, direct cyanidation testing was performed by JPL on a sample of sulphide mineralization from the Faina deposit. The testing resulted in an average gold extraction of 42.91% at 80% minus 200 mesh and an average gold extraction of 42.99% at 80% minus 270 mesh, indicating that a portion of the Faina deposit sulphide mineralization is refractory. In November 2008, direct cyanidation testing was performed by JPL on sulphide mineralization from Orebody D. The cyanidation testing resulted in an average gold extraction of 60.0% at 90% minus 200 mesh, indicating that a portion of Orebody D sulphide mineralization is refractory (Machado, 2011).

In October 2010, Jaguar engaged Resource Development Inc. (Rdi) to complete a metallurgical test program on a 150 kg composite sample from the Faina and Orebody D deposits. The objective of this test program was to identify and develop the best processing route for the extraction of gold from the refractory sulphide deposits. This metallurgical test program included grinding test work, gravity concentration, whole ore cyanidation, CIL, flotation and pressure oxidation of whole ore, and flotation concentrate. The Rdi test program indicated that 45% of the gold in the composite sample was free milling and the remaining gold was refractory. Rdi concluded the best treatment route for the composite sample tested was to float the sulphides, pressure oxidize the flotation concentrate, and treat the oxidized material and flotation tailings in a CIL circuit to recover gold. In this manner, the overall gold extraction for the refractory gold mineralization from the Faina and Orebody D deposits combined mineralized material is projected to be approximately 87.4% (Machado, 2011).

In September 2011, Rdi completed a metallurgical test program on an approximately 50 kg sample of refractory sulphide mineralization from the Pontal deposits. The objective of the testing was to determine if the metallurgical recovery of the refractory sulphide mineralization can be improved by roasting and subsequent cyanidation over direct cyanidation. Direct cyanidation resulted in a gold extraction of 58.0% and cyanidation of the roasted mineralization improved the gold extraction to 80.3% (Machado, 2011).

13.3.3 2021 Faina Metallurgical Testing Program

In 2021, the SLR QP carried out a preliminary review of the 2021 metallurgical test work program completed for the Faina deposit and the processing options under consideration. The objective of the test program was to perform laboratory tests to determine the best treatment route for the Faina mineralization. SLR reviewed the available process documentation provided by Jaguar as of July 2021, which included the following key documents:

- Preliminary Report by TDP (TDP, 2021a)
- Jaguar Mining Metallurgical Testing: Faina Project, presentation of preliminary results (TDP, 2021b)

13.3.3.1 Sample Preparation

TDP reported receiving samples of Faina material labelled Oxide (OX), Transition (TR), and Sulfide (SF) from Jaguar, however only the TR and SF material types were used in sample preparation. The TR and SF samples were obtained from only two drill holes, FUH168A and FUH171, and no other descriptions of the individual samples were provided. Individual samples from these drill holes were combined to produce two composite samples, SF1 and SF2, for test work, with average gold grades of 7.35 g/t Au and 8.50 g/t Au, respectively, as presented in Table 13-2. Composite sample SF1 consisted of individual samples of the SF type, however, two TR samples were combined with eight SF samples to prepare composite sample SF2. For composite sample SF2, no rationale was provided regarding the method of sample selection or combination. While the weights of individual samples from drill hole FUH169 were also provided, TDP provided no explanation as to why these samples were not used in composite sample preparation.

In the SLR QP's opinion, there is insufficient information from the TDP Report to evaluate whether the metallurgical samples selected for blending are representative of the material that will be mined and processed. The spatial representativeness of the drill hole locations of the metallurgical samples selected could not be confirmed by the SLR QP, as the drill holes were not included in the database provided for the Mineral Resources. TDP also did not provide specific details as to the procedures undertaken to prepare the samples and composites.

Table 13-2: Faina Composite Samples (SF1 and SF2)

Composite Sample	Drill Hole	Sample Number	Average Grade (g/t Au)	Material Type	Sample Weight (g)
SF1			7.35		
	FUH168A	FUH168A-0138	6.59	SF	8,275
	FUH168A	FUH168A-0139	1.565	SF	7,355
	FUH168A	FUH168A-0140	2	SF	6,990
	FUH168A	FUH168A-0141	8.47	SF	7,500
	FUH168A	FUH168A-0142	6.23	SF	7,205
	FUH168A	FUH168A-0143	4.63	SF	7,105

Composite Sample	Drill Hole	Sample Number	Average Grade (g/t Au)	Material Type	Sample Weight (g)
	FUH168A	FUH168A-0144	11.15	SF	7,785
	FUH168A	FUH168A-0145	7.76	SF	7,710
	FUH168A	FUH168A-0146	18.45	SF	7,885
	FUH168A	FUH168A-0147	1.37	SF	7,560
	FUH168A	FUH168A-0148	2.09	SF	8,210
	FUH168A	FUH168A-0149	4.7	SF	7,900
	FUH168A	FUH168A-0150	2.9	SF	8,375
	FUH168A	FUH168A-0151	13.25	SF	8,025
	FUH168A	FUH168A-0152	11.1	SF	7,680
	FUH168A	FUH168A-0154	11.9	SF	7,610
	FUH168A	FUH168A-0155	10.75	SF	7,365
SF2			8.50		
	FUH168A	FUH168A-0126	11.75	SF	7,125
	FUH168A	FUH168A-0127	23.7	SF	7,905
	FUH171	FUH171-0031	3.39	TR	5,395
	FUH171	FUH171-0032	11.35	TR	6,930
	FUH171	FUH171-0033	3.1	SF	6,295
	FUH171	FUH171-0034	4.26	SF	7,120
	FUH171	FUH171-0035	9.54	SF	5,390
	FUH171	FUH171-0036	4.08	SF	7,365
	FUH171	FUH171-0037	9.17	SF	6,140
	FUH171	FUH171-0038	1.73	SF	7,040

13.3.3.2 Head Analyses

All chemical analyses on samples SF1 and SF2 were performed by SGS Geosol in Vespasiano, Minas Gerais, Brazil, and results are presented in Table 13-3. The average gold grade of sample SF1 was 6.88 g/t Au, while Sample SF2 was higher in gold grade and averaged 9.13 g/t Au. Possible deleterious elements in the Faina mineralization include arsenic and antimony. Concentrations of arsenic were high in both composite samples and averaged more than 10,000 ppm As. Concentrations of antimony were also higher in sample SF1 (1,647 ppm Sb) in comparison to sample SF2 (45 ppm Sb).

Table 13-3: Chemical Analyses of Faina Composite Samples (SF1 and SF2)

Element	Units	SF1	SF2	Element	Units	SF1	SF2
Au	g/t	6.88	9.13				

Element	Units	SF1	SF2	Element	Units	SF1	SF2
S	%	3.21	3.36				
ICP Analyses							
Ag	ppm	< 3	< 3	Ni	ppm	96	56
Al	%	5.66	5.44	P	%	0.03	0.04
As	ppm	> 10,000	> 10,000	Pb	ppm	23	< 8
Ba	ppm	146	180	S	%	3.14	3.15
Be	ppm	< 3	< 3	Sb	ppm	1,647	45
Bi	ppm	< 20	< 20	Sc	ppm	34	29
Ca	%	5.64	5.74	Se	ppm	< 20	< 20
Cd	ppm	< 3	< 3	Sn	ppm	< 20	< 20
Co	ppm	47	38	Sr	ppm	137	107
Cr	ppm	56	28	Th	ppm	< 20	< 20
Cu	ppm	136	97	Ti	%	0.42	0.53
Fe	%	8.16	7.75	Tl	ppm	< 20	< 20
K	%	1.39	1.89	U	ppm	< 20	< 20
La	ppm	< 20	< 20	V	ppm	204	238
Li	ppm	39	54	W	ppm	266	526
Mg	%	2.45	2.54	Y	ppm	16	21
Mn	%	0.15	0.2	Zn	ppm	71	145
Mo	ppm	< 3	< 3	Zr	ppm	36	41
Na	%	0.79	0.52				

13.3.3.3 Metallurgical Testing

Figure 13-7 presents a flowchart prepared by TDP outlining the general scope of work for testing the Faina composite samples. The SLR QP notes that not all activities proposed were performed by TDP. There was no evidence of mineralogical characterization work or comminution testing having been performed prior to the design of the test program. The SLR QP is of the opinion that conducting a mineralogical examination of representative samples of a statistically reliable size prior to conducting any testing would help to identify gold grain size distribution, gold mineral type, liberation characteristics of all valuable minerals, and the nature and concentrations of minerals detrimental to processing (e.g., cyanide consuming minerals, clays, etc.), and avoid unnecessary test work. Full particle size analyses and Bond Ball Mill Work Index (WI) were also not reported. The SLR QP also notes that test work proposed for flotation products (settling and filtration tests, classification tests, and ARD tests) were not performed.

TDP conducted a series of diagnostic tests on composite samples SF1 and SF2 to determine the amenability of gold extraction using different techniques, including:

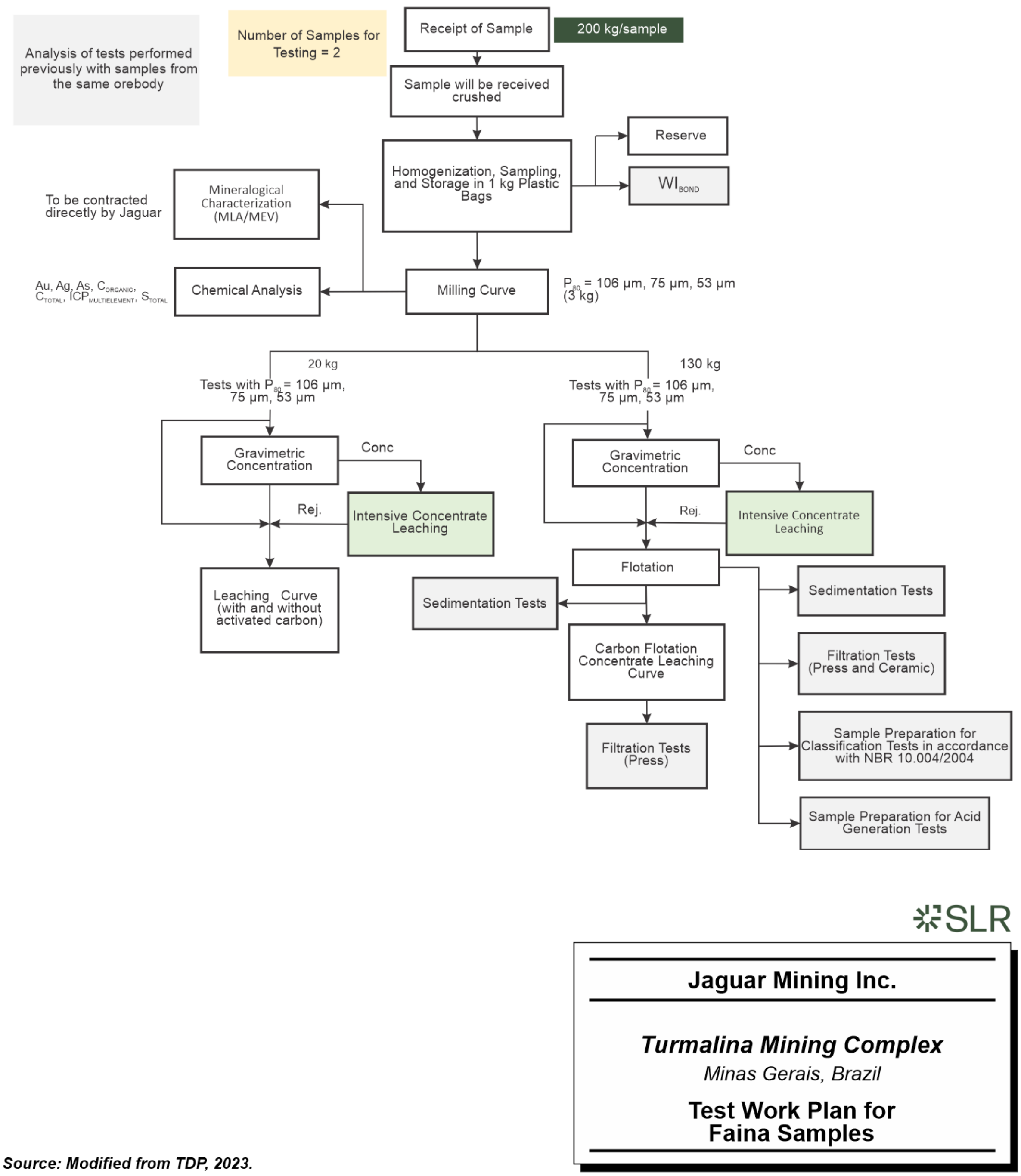
- Gravity concentration tests using a Knelson MD3 concentrator
- Bottle roll simulated intensive leaching tests of gravity concentrate

- Bottle roll direct leaching tests
- Bottle roll simulated carbon-in-leach (CIL) tests (cyanide leaching with activated carbon)
- Alkaline leaching (NaOH digestion) and cyanide leaching tests on gravity concentrate
- Flotation tests on the combined gravity and intensive leach tails to produce a rougher concentrate
- Alkaline leaching and cyanide leaching tests on flotation concentrate
- Bioleaching tests

All test parameters and procedures were reported by TDP, except for the bioleaching tests (results are pending). The total quantity of sample SF2 was smaller than sample SF1, therefore, some tests were only performed using sample SF1.

Table 13-4 summarizes the results demonstrating the best gold recoveries reported for composite sample SF1 from various tests. Table 13-5 summarizes the results demonstrating the best gold recoveries for composite sample SF2 from various tests.

Figure 13-7: Test Work Plan for Faina Samples



Source: Modified from TDP, 2023.

Table 13-4: Summary of Tests on Composite Sample SF1

TDP Test No.	Sample No.	Estimated Head Grade (g/t Au)	Test Description	Particle Size (P_{80}µm)	Calculated Head Grade (g/t Au)	Overall Recovery (%Au)
LT2	SF1	6.88	Direct Leaching	106	7.45	49.1
LT4	SF1	6.88	Direct Leaching	75	7.63	49.85
LT6	SF1	6.88	Direct Leaching	53	7.51	53.51
LT7	SF1	6.88	CIL	106	6.89	45.28
LT10	SF1	6.88	CIL	75	7.03	46.09
LT11	SF1	6.88	CIL	53	6.91	48.97
LT13	CG1	6.88	Knelson Gravity Concentration	75	7.07	16.96
LT13	SF1-CG1-CT1	6.88	Intensive Leaching of Gravity Concentrate	75	7.07	53.52
LT14	SF1	6.88	NaOH Digestion + Cyanide Leach of Gravity Concentrate	53	7.52	54.27
LT15	CG1	6.88	Knelson Gravity Concentration	53	7.02	7.3
LT15	SF1-CG1-CT2	6.88	Intensive Leaching of Gravity Concentrate (LT15)	53	7.02	100
LT17	SF1-RG-CT2	6.88	Gravity Concentration (LT15) + Cyanide Leaching of Gravity Tails	53	6.27	56.32
FT3	SF1	6.88	Flotation of Gravity Tails	106	7.03	86.83
FT10	SF1	6.88	Flotation of Gravity Tails	75	6.9	89.12
FT15	SF1	6.88	Flotation of Gravity Tails	53	7.06	88.88
FT20	SF1-RG-CT3	6.88	Gravity Concentration + Flotation of Gravity Tails	53	6.7	92.36
FT22	SF1	6.88	Secondary Flotation Test of Gravity Tails	53	6.46	90.93
FT25	SF1	6.88	Flotation of Gravity Tails	53	7.21	91.66
LT19	SF1-CF-FT25	25.3	NaOH Digestion + Cyanide Leach of Flotation Concentrate (FT25)	53	25.79	46.28

Table 13-5: Summary of Tests on Composite Sample SF2

TDP Test No.	Sample No.	Estimated Head Grade (g/t Au)	Test Description	Particle Size (P_{80} µm)	Calculated Head Grade (g/t Au)	Overall Recovery (%Au)
LT1	SF2	9.13	Direct Leaching	106	8.47	62.76
LT4	SF2	9.13	Direct Leaching	75	8.14	61.25
LT6	SF2	9.13	Direct Leaching	53	8.98	59.78
LT7	SF2	9.13	CIL	106	7.97	61.05
LT9	SF2	9.13	CIL	75	7.83	62.27
LT12	SF2	9.13	CIL	53	7.39	60.27
LT13	CG1	9.13	Knelson Gravity Concentration	75	7.8	29.54
LT13	SF2-CG1-CT1	9.13	Intensive Leaching of Gravity Concentrate	75	7.8	75.38
LT14	SF2	9.13	NaOH Digestion + Cyanide Leach of Gravity Concentrate	53	8.04	69.84
LT15	CG1	9.13	Knelson Gravity Concentration	53	8.01	21.56
LT15	SF2-CG1-CT2	9.13	Intensive Leaching of Gravity Concentrate (LT15)	53	8.01	100
LT16	SF2-RG-CT2	9.13	Gravity Concentration (LT15) + Cyanide Leaching of Gravity Tails	53	6.04	52.97
FT5	SF2	9.13	Flotation of Gravity Tails	106	7.9	86.25
FT10	SF2	9.13	Flotation of Gravity Tails	75	7.81	88.49
FT15	SF2	9.13	Flotation of Gravity Tails	53	7.82	87.72
FT17	SF2	9.13	Secondary Flotation Test of Gravity Tails	53	7.66	89.72

13.3.3.4 Faina Sample SF1

Gravity Concentration

A sample of the Faina SF1 composite was ground to 75 µm, the prescribed particle size distribution for flotation and CIL testing, and then subjected to gravity concentration, by passing the composite sample through a Knelson MD3 concentrator. The purpose of the test was to determine whether there was enough free gold in the sample to require a gravity recovery step prior to planned leach and flotation testing to prevent assay variability problems. Table 13-6 presents the results of the tests. The Au recovery from the test was 14.38%, which is a moderate result for gravity recoverable gold tests.

Table 13-6: Results of Gravity Concentration of Faina Composite Sample Test 13

Sample	Jaguar Faina
Gravity Concentration Test No.	SF1 Test 13

Sample	Jaguar Faina
P80, µm	75
Au Feed Grade, g/t	6.88
Au Calculated Feed Grade, g/t	6.85
Au Recovery to Concentrate, g/t	36.70
Mass Recovery to Concentrate, %	2.68
Au Recovery to Concentrate, %	14.38

Intensive Cyanidation of Gravity Concentrate

Intensive cyanide leaching was performed on the Test 13 gravity concentrate. The concentrate was leached for 12 hrs in a solution containing 10 g/L NaCN, resulting in a Au tailings grade of 15.95 g/t and a Au recovery of 43.5%. The overall gravity Au recovery for Test 13 was 6.25%.

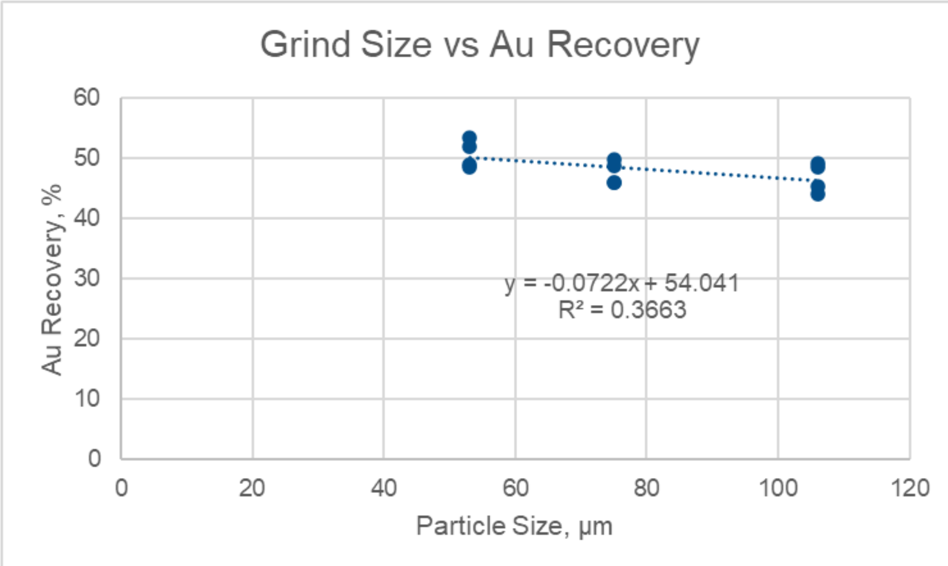
Direct Cyanide Leaching Tests SF1 - 2021

A series of direct leaching tests were performed on sample composite SF1 to determine the effects of leaching with and without carbon and without gravity separation. The results are presented Table 13-7. The results of the SF1 tests indicate that Au recovery is higher for the direct leach tests than the CIL tests and that the Au recovery is proportional to particle size distribution. Figure 13-8 presents the relationship between particle size and Au recovery for the SF1 sample. The data in the table indicate that NaCN consumption increases with a decrease in particle size, which may also affect Au recovery.

Table 13-7: Cyanide Leach Tests on Samples of the SF1 Composite

	Sample Name	Analysis	Grind Size, P80	Assay Head Grade, g/t	Calc Head Grade, g/t	Leach Residence Time, h	CIL Leach Tailings, g/t	Leach Recovery, %	Global Recovery, %	NaCN Consumption, kg/t	Lime Consumption, kg/t
Faina 2021 Direct Leaching											
SF1	LT1	Jaguar	106	6.88	7.22	24	3.72	48.57	48.57	1.246	1.48
SF1	LT2	Jaguar	106	6.88	7.45	24	3.79	49.1	49.10	1.26	1.47
SF1	LT3	Jaguar	75	6.88	7.33	24	3.76	48.77	48.77	1.35	1.49
SF1	LT4	Jaguar	75	6.88	7.63	24	3.83	49.85	49.85	1.352	1.51
SF1	LT5	Jaguar	53	6.88	7.26	24	3.49	51.98	51.98	2.129	1.44
SF1	LT6	Jaguar	53	6.88	7.51	24	3.49	53.51	53.51	2.161	1.44
Faina 2021 CIL											
SF1	LT7	Jaguar	106	7.4	6.89	24	3.77	45.28	45.28	1.295	1.65
SF1	LT8	Jaguar	106	7.4	6.95	24	3.88	44.18	44.18	1.323	1.65
SF1	LT9	Jaguar	75	7.4	6.93	24	3.75	46.0	46.0	1.346	1.65
SF1	LT10	Jaguar	75	7.4	7.03	24	3.79	46.09	46.09	1.325	1.65
SF1	LT11	Jaguar	53	7.4	6.91	24	3.79	48.97	48.97	2.023	1.65
SF1	LT12	Jaguar	53	7.4	6.7	24	3.45	48.62	48.62	2.027	1.64

Figure 13-8: SF1 Grind Particle Size vs Au Recovery



Flotation Tests of SF1 Samples

Flotation testing was performed on SF1 composite samples. The results of the rougher tests are presented in Table 13-8. At a P_{80} of 75 µm and 53 µm, the best flotation performance was achieved using the following combination of reagents: potassium amyl xanthate (PAX, a collector), A_20_8 (alkyl dithiophosphate, a collector), and Flottec INT_102 (frother). Gold recoveries in flotation test FT10 (P_{80} = 75 µm) and flotation test FT15 (P_{80} = 53 µm) were 89.12% and 88.88%, respectively.

Table 13-8: Summary of Direct Flotation Results for Faina SF1 Composite

Test	P80	Time (min)	Feed Calc Head, Au (g/t)	Feed Analyzed Head Au (g/t)	Mass Pull (%)	Calc Head, Au (g/t)	Conc Grade, Au (g/t)	Residue Grade (g/t)	Recovery in Rougher Flotation, Au (%)	Recovery in Rougher Flotation, S (%)
FT1	106 µm	20	7.03	6.88	19.26%	6.74	28.97	1.43	82.86%	54.92%
FT2		20			18.97%	6.85	30.89	1.22	85.56%	70.04%
FT3		20			20.59%	6.99	29.48	1.16	86.83%	72.06%
FT4		20			18.21%	6.95	32.21	1.33	84.35%	52.24%
FT5		20			20.88%	7.63	30.33	1.64	83.00%	60.24%
FT6	75 µm	0	6.90	6.88	17.47%	7.06	34.99	1.15	86.61%	64.19%
FT7		20			21.56%	6.96	27.85	1.22	86.25%	64.58%
FT8		20			17.63%	6.94	34.29	1.09	87.07%	56.35%
FT9		20			15.97%	6.76	34.91	1.42	82.42%	49.74%
FT10		20			21.07%	6.78	28.69	0.94	89.12%	52.76%

Test	P80	Time (min)	Feed Calc Head, Au (g/t)	Feed Analyzed Head Au (g/t)	Mass Pull (%)	Calc Head, Au (g/t)	Conc Grade, Au (g/t)	Residue Grade (g/t)	Recovery in Rougher Flotation, Au (%)	Recovery in Rougher Flotation, S (%)
FT11	53 µm	20	7.06	6.88	21.18%	6.80	28.12	1.07	87.65%	58.58%
FT12		20			18.57%	7.08	33.25	1.12	87.18%	57.97%
FT13		20			18.70%	7.45	35.46	1.01	88.98%	58.54%
FT14		20			15.05%	7.23	40.66	1.31	84.66%	49.94%
FT15		20			22.40%	6.74	26.73	0.97	88.88%	54.98%

The results of secondary flotation tests of gravity tailing are presented in Table 13-9. The tests were conducted using different reagents (copper sulphate, dithiophoshate, sodium isobutyl xanthate (SIBX) and Flottec INT_102 frother) to improve recoveries. Gold recoveries for the tests averaged 90.0%.

Table 13-9: Summary of Second Stage Rougher Flotation Results for Faina SF1 Composite

Test	P80	Time (min)	Feed Calc Head, Au (g/t)	Feed Analyzed Head Au (g/t)	Mass Pull (%)	Calc Head, Au (g/t)	Conc Grade, Au (g/t)	Residue Grade (g/t)	Recovery in Rougher Flotation, Au (%)	Recovery in Rougher Flotation, S (%)
FT21	53 µm	20	6.46	6.88	27.09%	6.50	21.78	0.82	90.80%	87.81%
FT22		20			27.10%	6.39	21.42	0.80	90.93%	86.96%
FT23		20			25.59%	6.47	22.55	0.94	89.19%	74.65%
FT24		20			24.66%	6.50	23.48	0.94	89.10%	74.94%

Flotation of Gravity Tailings – SF1

Gravity concentration and flotation of gravity tailings was performed on samples SF1 composite ground to 53 µm. The results of the tests are given in Table 13-10. Gravity Au recovery for the sample composite was 7.96%. Rougher flotation recovery ranged from 87.32% to 89.19% and averaged 87.1% and combined Au recovery was 87.8%. The reagents used for the two tests with the highest recoveries were Test FT16: 50 g/t copper sulfate, 80 g/t potassium amyl xanthate (PAX), and 42 g INT 102, and Test FT20: 80 g/t A208, 80 g/t PAX, and 42 g/t INT 102.

Table 13-10: Summary of Results of Flotation of Gravity Tailings

Sampl e Name	Grind Size, P80	Assay Head Grade (g/t)	Calc Head Grade (g/t)	Gravit y Conc Grade (g/t)	Gravity Recovery (%)	Gravit y Tailing Grade (g/t)	Flotation Mass Recovery (%)	Roughe r Conc Grade (g/t)	Rougher Tailings(g/t)	Flotation Recovery (%)
FT16	53	6.88	6.70	26.70	7.96	6.31	19.39	29.22	0.80	89.77

Sample Name	Grind Size, P80	Assay Head Grade (g/t)	Calc Head Grade (g/t)	Gravity Conc Grade (g/t)	Gravity Recovery (%)	Gravity Tailing Grade (g/t)	Flotation Mass Recovery (%)	Rougher Conc Grade (g/t)	Rougher Tailings(g/t)	Flotation Recovery (%)
FT17	53	6.88	6.70	26.70	7.96	6.13	17.99	29.88	0.92	87.75
FT18	53	6.88	6.70	26.70	7.96	6.00	18.07	29.50	0.83	88.74
FT19	53	6.88	6.70	26.70	7.96	6.33	19.29	28.65	1.00	87.32
FT20	53	6.88	6.70	26.70	7.96	6.70	25.25	24.50	0.69	92.36

Cyanidation of Flotation Concentrate

Flotation Test 25 included the flotation of SF1 material to generate a sulfide concentrate. The concentrate was leached at elevated temperature (80°C), with different concentrations of NaOH solution and then directly leached with NaCN. The results of the tests are presented in Table 13-11. The sample that was directly leached with NaCN without caustic leaching yielded the lowest recovery of 40.88%. The three tests using 3M, 5M, and 8M NaOH had nearly identical recoveries 46.8%, 44.92% and 44.94%, with the best of the three using 3M NaOH. The best test was leached with 20% $NaCO_3$ at 100°C yielding a Au recovery of 49.15%. None of the tests could be considered successful.

Table 13-11: Results of Alkaline and Direct Cyanide Leaching of Flotation Concentrate – SF1

	Test	Pre-leach	Calc Head Grade (g/t)	Flotation Mass Recovery (%)	Rougher Conc Grade (g/t)	Rougher Tailings (g/t)	Flotation Recovery (%)	Leach Calc Head Grade (g/t)	Leach Tailings Grade (g/t)	Leach Recovery (%)
FT 25	LT 19	3M NaOH, 80°C	7.21	25.76	25.65	0.81	91.66	25.65	13.86	46.28
FT 25	LT 20	5M NaOH, 80°C	7.21	25.76	25.65	0.81	91.66	25.65	13.98	44.92
FT 25	LT 21	8M NaOH, 80°C	7.21	25.76	25.65	0.81	91.66	25.65	14.47	44.94
FT 25	LT 22	Direct	7.21	25.76	25.65	0.81	91.66	25.65	14.88	40.88
FT 25	LT 04	20% $NaCO_3$, 100°C	7.33	24.26	27.55	0.86	91.17	27.55	14.01	49.15

Rougher Cleaner Flotation

Rougher and single stage cleaning tests were performed on the composite samples in tests FT26 and FT27. Rougher flotation produced two concentrates that were combined and processed in the cleaner flotation cells. The calculated head grade of the feed for both tests was 7.31 g/t Au.

The combined rougher concentrate mass pull for FT26 was 25.15%, the concentrate grade was 26.48 g/t, and the overall rougher flotation recovery was 91.37%. The cleaner concentrate mass pull was 59.84%, the cleaner concentrate grade was 41.39 g/t and the cleaner recovery was 93.52% resulting in an overall flotation recovery of 85.45%.

The combined rougher concentrate mass pull for FT27 was 24.23%, the concentrate grade was 27.77 g/t, and the overall rougher flotation recovery was 91.78%. The cleaner concentrate mass pull was 64.12%, the cleaner concentrate grade was 40.92 g/t and the cleaner recovery was 94.48% resulting in an overall flotation recovery of 86.72%.

Table 13-12: Rougher/Cleaner Flotation – SF1

	Sample Name	Assay Head Grade (g/t)	Calc Head Grade (g/t)	Rougher Mass Recovery (%)	Rougher Conc Grade (g/t)	Rougher Tailings (g/t)	Flotation Recovery (%)	Cleaner Mass Recovery (%)	Cleaner Con Grade (g/t)	Cleaner Tailings (g/t)	Cleaner Recovery (%)	Global Recovery (%)
FT 26	LT 19	6.88	7.31	25.15	26.48	0.84	91.37	59.84	41.39	4.27	93.52	85.45
FT 27	LT 20	6.88	7.31	24.23	27.77	0.80	91.78	64.12	40.92	5.00	94.48	86.72

Diagnostic Leaching of Test LT12 Tailings

Diagnostic leaching of the Test LT12 tailings was performed using acid dissolution methods. The results indicated that the ore is refractory.

Cyanidation of LT12 CIL Tailings with Bacterial Oxidation

Preliminary bacterial leaching was performed on a sample of test LT12 leach tailings. The grade of the tailings was 3.45 g/t Au. The samples were leached for 24 hours with a leach solution containing 3 kg/t NaCN. The final leach Au recovery was 14.0%. The cyanide and lime consumptions were 2.328 kg/t NaCN and 3.6 kg/t CaO. No further tests were performed.

13.3.3.5 Faina Sample SF2

Determination of Crystalline Minerals using Xray Diffraction

The leach tailings from test LT12 were analyzed using X-ray diffraction to determine the crystalline minerals present. The results of the tests are presented in Table 13-13.

Table 13-13: Faina Xray Diffraction Analyses of Faina SF2 Leach Tailings Sample

ICDD	Mineral	Chemical Formula
01-079-1910	Quartz	SiO_2
00-029-0701	Chlorite	$(Mg,Fe)_6(Si,Al)_4O_{10}(OH)_8$
01-076-0929	Muscovite	$KAl_2Si_3AlO_{10}(OH)_2$
01-072-1651	Calcite	$CaCO_3$
01-073-1135	Amphibole	$Al_{3.2}Ca_{3.4}Fe_{4.02}K_{0.6}Mg_6NaSi_{12.8}O_{44}(OH)_4$
01-083-1608	Albite	$NaAlSi_3O_8$
01-089-2853	Arsenopyrite	FeAsS

Gravity Concentration Testing

A sample of the Faina SF2 composite was ground to 75 µm, the prescribed particle size distribution for flotation and CIL testing, and then subjected to gravity concentration, by passing the composite sample through a Knelson MD3 concentrator. The purpose of the test was to determine whether there was enough free gold in the sample to require a gravity recovery step prior to planned leach and flotation testing to prevent assay variability problems. Table 13-14 presents the results of the tests. The Au recovery from the test was 29.54%, which is a good result for gravity recoverable gold tests and a reason to perform gravity recovery prior to leach and flotation tests.

Table 13-14: Results of Gravity Concentration of Faina Composite Sample Test 13

Sample	Jaguar Faina
Gravity Concentration Test No.	SF2 Test 13
P80, µm	75
Au Feed Grade, g/t	9.13
Au Calculated Feed Grade, g/t	7.80
Au Recovery to Concentrate, g/t	88.78
Mass Recovery to Concentrate, %	2.60
Au Recovery to Concentrate, %	29.54

Intensive Cyanidation of Gravity Concentrate

Intensive cyanide leaching was performed on the Test 13 gravity concentrate. The concentrate was leached for 12 in a solution containing 10 g/L NaCN, resulting in a Au tailings grade of 21.86 g/t and a Au recovery of 75.4%. The overall gravity Au recovery for Test 13 was 22.27%.

Direct Cyanide Leach Testing

A series of direct leaching tests were performed on sample composite SF2 to determine the effects of leaching with and without carbon and without gravity separation. The results are presented Table 13-15. The results of the SF2 tests indicate that average Au recovery for the direct and CIL leach tests were the same at 60.05% and 60.5% respectively. The Au recovery versus particle size distribution presented in Figure 13-9 indicates lower recovery as the particle size decreases; the opposite of what is typically expected. Au recovery versus NaCN consumption and NaCN consumption versus particle size, presented in Figure 13-10 and Figure 13-11, respectively, indicate that the finer the grind, the higher the NaCN consumption and the lower the gold recovery. The reason for the low gold recovery is probably low free NaCN concentrations in solution due to the increased NaCN consumption from increased sulfide surfaces exposed.

Table 13-15: Cyanide Leach Tests on Samples of the SF2 Composite

	Sample Name	Analysis	Grind Size, P80	Assay Head Grade, g/t	Calc Head Grade, g/t	Leach Residence Time, h	CIL Leach Tailings, g/t	Leach Recovery, %	Global Recovery, %	NaCN Consumption, kg/t	Lime Consumption, kg/t
Faina 2022 Direct Leaching											
SF2	LT1	Jaguar	106	9.13	8.47	24	3.16	62.76	62.76	0.86	2.00
SF2	LT2	Jaguar	106	9.13	8.36	24	3.18	62.04	62.04	0.87	2.00
SF2	LT3	Jaguar	75	9.13	8	24	3.11	61.10	61.10	1.00	1.99
SF2	LT4	Jaguar	75	9.13	8.14	24	3.16	61.25	61.25	1.00	1.99
SF2	LT5	Jaguar	53	9.13	8.08	24	3.77	53.41	53.41	2.26	1.97
SF2	LT6	Jaguar	53	9.13	8.98	24	3.61	59.78	59.78	2.29	1.98
Faina 2021 CIL											
SF2	LT7	Jaguar	106	9.13	7.97	24	3.11	61.05	61.05	0.98	1.53

	Sample Name	Analysis	Grind Size, P80	Assay Head Grade, g/t	Calc Head Grade, g/t	Leach Residence Time, h	CIL Leach Tailings, g/t	Leach Recovery, %	Global Recovery, %	NaCN Consumption, kg/t	Lime Consumption, kg/t
SF2	LT8	Jaguar	106	9.13	7.93	24	3.16	60.17	60.17	0.82	1.25
SF2	LT9	Jaguar	75	9.13	7.83	24	2.96	62.27	62.27	1.02	1.25
SF2	LT10	Jaguar	75	9.13	7.77	24	2.95	62.06	62.06	1.03	1.25
SF2	LT11	Jaguar	53	9.13	7.85	24	2.95	57.38	57.38	2.42	1.63
SF2	LT12	Jaguar	53	9.13	7.39	24	2.94	60.27	60.27	2.44	1.24

Figure 13-9: SF2 Grind Particle Size vs Au Recovery

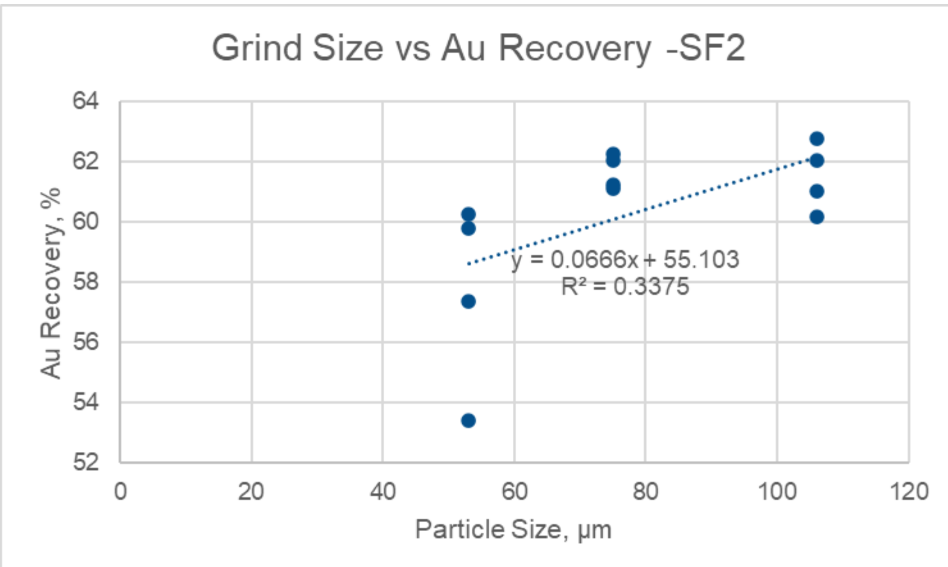


Figure 13-10: SF2 NaCN Consumption vs Au Recovery

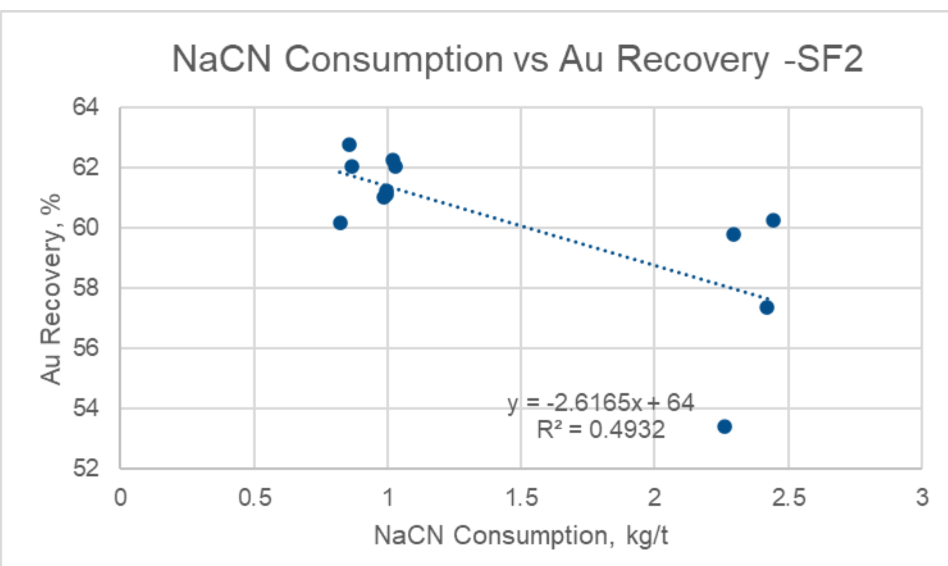
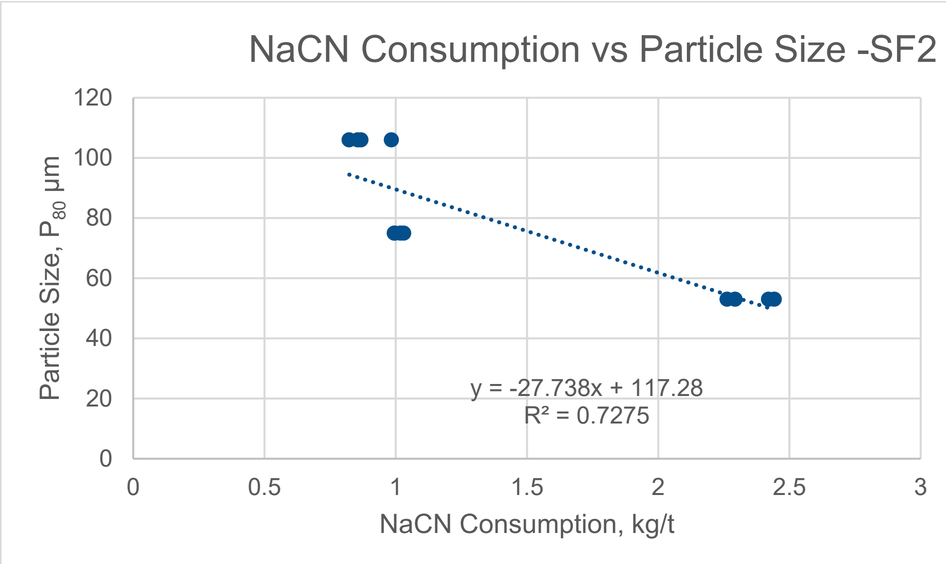


Figure 13-11: SF2 NaCN Consumption vs Au Recovery



Flotation Tests of SF2 Composite Samples

Flotation testing was performed on SF2 composite samples. The results of the tests are presented in Table 13-16. At a P_{80} of 75 µm and 53 µm, the best flotation performance was achieved using the following combination of reagents: PAX, A208, and Flottec INT_102. Gold recoveries in flotation test FT10 (P_{80} = 75 µm) and flotation test FT15 (P_{80} = 53 µm) were 89.49% and 87.72%, respectively.

Table 13-16: Summary of Flotation Results for Faina SF2 Composite

Test	P80	Time (min)	Feed Calc Head, Au (g/t)	Feed Analyzed Head Au (g/t)	Mass Pull (%)	Calc Head, Au (g/t)	Conc Grade, Au, g/t	Residue Grade, g/t	Recovery in Rougher Flotation, Au, %	Recovery in Rougher Flotation, S, %
FT1	106 µm	20	7.90	9.13	18.64%	8.51	38.40	1.67	84.09%	73.86%
FT2		20			14.90%	7.25	40.91	1.36	84.04%	73.15%
FT3		20			13.98%	7.46	42.51	1.76	79.70%	61.80%
FT4		20			14.32%	7.60	42.56	1.76	80.21%	59.72%
FT5		20			17.65%	8.68	42.43	1.45	86.25%	72.21%
FT6	75 µm	0	7.81	9.13	16.10%	7.94	43.15	1.19	87.43%	75.86%
FT7		20			18.30%	7.76	36.65	1.29	86.43%	88.63%
FT8		20			13.29%	7.77	48.48	1.53	82.92%	60.03%
FT9		20			13.77%	7.79	45.82	1.72	81.02%	56.21%
FT10		20			17.31%	7.79	39.84	1.09	88.49%	66.40%

Test	P80	Time (min)	Feed Calc Head, Au (g/t)	Feed Analyzed Head Au (g/t)	Mass Pull (%)	Calc Head, Au (g/t)	Conc Grade, Au, g/t	Residue Grade, g/t	Recovery in Rougher Flotation, Au, %	Recovery in Rougher Flotation, S, %
FT11	53 µm	20	7.82	9.13	13.63%	7.50	46.86	1.29	85.20%	66.93%
FT12		20			15.10%	7.94	45.20	1.32	85.94%	58.40%
FT13		20			14.97%	7.64	43.42	1.34	85.08%	52.45%
FT14		20			17.87%	8.37	40.13	1.46	85.68%	53.03%
FT15		20			17.27%	7.64	38.82	1.14	87.72%	56.72%

The results of secondary flotation tests of gravity tailing are presented in Table 13-17. The tests were conducted using different reagents (copper sulphate, dithiophoshate, sodium isobutyl xanthate (SIBX) and Flottec INT_102 frother) to improve recoveries. Gold recoveries for the tests averaged 88.2%.

Table 13-17: Summary of Second Stage Rougher Flotation Results for Faina SF2 Composite

Test	P80	Time (min)	Feed Calc Head, Au (g/t)	Feed Analyzed Head Au (g/t)	Mass Pull (%)	Calc Head, Au (g/t)	Conc Grade, Au, g/t	Residue Grade, g/t	Recovery in Rougher Flotation, Au, %	Recovery in Rougher Flotation, S, %
FT16	53 µm	20	7.66	9.13	22.09%	7.39	29.46	1.14	87.99%	86.92%
FT17		20			23.29%	8.09	31.18	1.09	89.72%	87.75%
FT18		20			20.12%	7.56	32.77	1.21	87.21%	70.39%
FT19		20			21.10%	7.61	31.73	1.16	87.97%	70.21%

Bacterial Leaching of Sample SF2

Preliminary bacterial leaching was performed on a sample of test LT2 leach tailings. The grade of the tailings was 2.94 g/t Au. The samples were leached for 24 hours with a leach solution containing 3 kg/L NaCN. The final leach Au recovery was 7.22%. The cyanide and lime consumptions were 2.253 kg/t NaCN and 3.6 kg/t CaO. No further tests were performed.

13.3.4 2022–2023 Faina Metallurgical Testing Program

The metallurgical testing programs continued from the findings and recommendations of the 2021 test programs. The 2022 program focused on comparative metallurgical testing between Turmalina and Faina materials with test conditions based on the existing Turmalina cyanidation parameters. The test work included gravity concentration, direct cyanidation and carbon in leach (CIL) testing with and without prior gravity concentration, flotation of sulfide minerals and cyanidation of both flotation concentrates and flotation tailings. Leaching tests were also performed using various leach additives to determine whether improvements in recovery were possible. A separate pressure oxidation (POX) test program was conducted by Sherritt

International to determine the amenability of the ore to acid pressure oxidation of the sulfide minerals to liberate Au, followed by neutralization and cyanidation for Au recovery.

13.3.4.1 Head Sample

TDP received approximately 319.4 kg of Faina drill core mineral samples from the Jaguar Mining Turmalina Project. Table 13-18 presents the drill holes, sample intervals and masses of each of the drill core samples. The samples were crushed, blended, and split into five samples for analysis. Table 13-19 presents the results of Au, S, and C analyses and Table 13-20 presents the ICP elemental analyses of subsample JFA-AL5. The significant deleterious elements from the analyses include 2.66 % S, 1% C, >10,000 ppm (1%) As, 129 ppm Cu and 460 ppm Sb.

Table 13-18: Faina Drill Core Samples Received by Laboratory

Drill Hole	Interval	Mass (kg)	Drill Hole	Interval	Mass (kg)
FUH-210	329-336	9.2	FUH-188	172-179	5.6
FUH-207	452-455	16.4	FUH-198	202-204	3.4
FUH-186	288-294	8.9	FUH-196	208-210	10.4
FUH-208	225-228	4.7	FUH-196	299-310	11.0
FUH-199	167-170	5.6	FUH-215	270-273	7.5
FUH-182	285-289	8.2	FUH-180	229-242	23.3
FUH-217	331-334	6.5	FUH-184	203-207	7.1
FUH-214	391-395	8.0	FUH-195	146-148	15.7
FUH-216	299-303	20.8	FUH-211	273-275	4.5
FUH-203	197-199	11.3	FUH-212	268-271	7.2
FUH-204	234-236	9.9	FUH-193	174-177	3.4
FUH-192	274-275	9.3	FUH-194	186-189	4.0
FUH-179	164-168	5.4	FUH-178	219-221	4.6
FUH-231	371-374	7.0	FUH-181	172-175	5.4
FUH-189	354-357	4.7	FUH-185	62-75	22.0
FUH-205	209-211	6.4	FUH-183	210-223	17.1
FUH-205	314-317	5.0	FUH-185	163-172	12.3
FUH-191	241-253	12.4			

Table 13-19: Head Analysis of Composite Samples Splits

Sample	Au (ppm)	S (%)	C (%)
JFA-AL1	6.08	2.60	1.04
JFA-AL2	6.22	2.63	1.05
JFA-AL3	6.54	2.67	1.09
JFA-AL4	6.41	2.71	1.04

Sample	Au (ppm)	S (%)	C (%)
JFA-AL5	-	2.70	1.07
Average	6.31	2.66	1.06
Standard Dev	0.20	0.05	0.02

Table 13-20: ICP Elemental Analysis of Composite Sample JFA-AL5

Element	Units	JFA - AL5	Element	Units	JFA - AL5
ICP Analyses					
Ag	ppm	< 3	Ni	ppm	118
Al	%	5.66	P	%	0.04
As	ppm	> 10,000	Pb	ppm	<8
Ba	ppm	187	S	%	2.28
Be	ppm	< 3	Sb	ppm	460
Bi	ppm	< 20	Sc	ppm	31
Ca	%	5.02	Se	ppm	< 20
Cd	ppm	< 3	Sn	ppm	< 20
Co	ppm	50	Sr	ppm	97
Cr	ppm	75	Th	ppm	< 20
Cu	ppm	129	Ti	%	0.55
Fe	%	8.06	Tl	ppm	< 20
K	%	1.44	U	ppm	< 20
La	ppm	< 20	V	ppm	221
Li	ppm	41	W	ppm	156
Mg	%	2.3	Y	ppm	17
Mn	%	0.19	Zn	ppm	97
Mo	ppm	< 3	Zr	ppm	26
Na	%	0.97			

13.3.4.2 Gravity Concentration Testwork on the Faina Composite Sample

Two samples of the Faina composite were ground to the prescribed particle size distribution for flotation and CIL testing and then subjected to gravity concentration, by passing 10 kg of each composite sample through a Knelson MD3 concentrator. The purpose of the tests was to remove any coarse free gold from the sample that would cause assay variability in the subsequent CIL and flotation test work. Table 13-21 presents the results of the tests. The CT2 and CT3 tests were performed on material ground to 75 µm and 53µm respectively. The Au recovery from Tests CT2 and CT3 were 7.83% and 7.9% respectively which is relatively low for gravity recoverable gold tests.

Table 13-21: Results of Gravity Concentration of Faina Composite Samples

Parameters and Results	Sample CT2	Sampel CT3
Gravity Concentration Test No.	CT2	CT3
P80, µm	75	53
Au Feed Grade, g/t	6.31	6.31
Au Calculated Feed Grade, g/t	5.82	5.99
Au Recovery to Concentrate, g/t	64.36	100.2
Mass Recovery to Concentrate, %	0.71	0.47
Au Recovery to Concentrate, %	7.83	7.9

13.3.4.3 Intensive Cyanidation of Gravity Concentrate

Test CT6 was ground to 75µm and subjected to a gravity recoverable gold test and concentrate from the test was subjected to high intensity cyanide leaching to recover the gold. The results indicate that 8.32% of the Au contained in test CT6 was recovered into a gravity concentrate comprising 0.67% of the initial feed mass and grading 70.49 g/t Au. Intensive cyanide leaching of the concentrate for 12 h, with a slurry density of 27% solids and a solution concentration of 10 g/L NaCN, resulted in a Au tailings grade 24.1 g/t and a Au recovery of 65.94%.

13.3.4.4 CIL Leaching of Gravity Concentration Tailings

Carbon in leach (CIL) testing was performed on two composite samples following gravity concentration. The tests were performed in duplicate and the conditions included a 6 hr preleach with lime and a 48 hr CIL leach retention time. LT11 and LT12 were ground to 75 µm and LT15 and LT16 were ground to 53 µm. The results of the tests are presented in Table 13-22. The leach recoveries for LT11 and LT 12 averaged 48.35% and the leach recoveries for LT15 and LT16 averaged 51.77% indicating a sensitivity to particle size distribution.

Table 13-22: Gravity Concentration followed by Cyanide Leaching of Gravity Tailings

Sample Name	Grind Size, P80	Assay Head Grade, g/t	Calc Head Grade, g/t	Gravity Conc Mass Recovery, %	Gravity Conc Grade, g/t	Gravity Recovery, %	Gravity Tailing Grade, g/t	CIL Leach Tailings, g/t	Leach Recovery, %	Global Recovery, %	NaCN Cons, kg/t	Lime Cons, kg/t
LT11	75	6.31	5.82	0.71	64.36	7.83	5.34	2.96	44.69	49.21	2.55	2.78
LT12	75	6.31	5.82	0.71	64.36	7.83	5.42	3.06	43.64	47.49	2.25	2.78
LT15	53	6.31	5.99	0.47	100.2	7.9	5.48	2.88	47.46	51.89	2.70	3.05
LT16	53	6.31	5.99	0.47	100.2	7.9	5.51	2.90	47.46	51.64	2.80	2.96

13.3.4.5 Direct CIL Leaching

Direct carbon in leach (CIL) testing was performed on two composite samples in duplicate without gravity concentration. The tests conditions included a six hour pre-leach with lime and a 48 hr CIL leach retention time. LT1 and LT2 were ground to 75 µm and LT5 and LT6 were ground to 53 µm. The results of the tests are presented in Table 13-23. The leach recoveries for LT1 and LT2 averaged 48.0% and the leach recoveries for LT5 and LT6 averaged 49.27% indicating a slight sensitivity to particle size distribution. The tests results were almost identical to those with gravity recovery indicating that gravity recovery does not contribute significantly to gold recovery. NaCN consumption is relatively high ranging from 2.4 kg/t to 2.75 kg/t.

Table 13-23: Results of Direct Carbon in Leach (CIL) Testing without Gravity Concentration

Sample Name	Grind Size, P80	Preleach with Lime, h	Air or Oxygen	Assay Head Grade, g/t	Calc Head Grade, g/t	Leach Residence Time, h	CIL Leach Tailings, g/t	Leach Recovery, %	NaCN Cons, kg/t	Lime Cons, kg/t
LT1	75	6	Air	6.31	5.35	48	2.79	47.96	2.559	1.95
LT2	75	6	Air	6.31	5.52	48	2.87	48.1	2.414	1.76
LT5	53	6	Air	6.31	5.49	48	2.72	50.43	2.749	2.76
LT6	53	6	Air	6.31	5.44	48	2.83	48.11	2.569	3.08

13.3.4.6 Direct CIL Cyanidation under Different Conditions

Direct CIL tests were performed on composite samples and in one case flotation tailings using the standard 6 hour preleach followed by 48 hours of CIL and with a variety of leach additives including O_2, air, $Pb(NO_3)_2$, H_2O_2 and the polymer ZT POLY MINE. The objective is to determine the effects of using additives in the leaching process on Au recovery. The results of the CIL tests are presented in Table 13-24. Reviewing the results of the tests leads to the following conclusions:

The highest 18-hr leach recovery was 66.06% using air and 400 g/t ZT Polymine though the recovery dropped to 44.4% after 24 hours of leaching indicating reprecipitation.

In all cases, using hydrogen peroxide and ZT Polymine had higher recoveries after 18 hours than after 24 hours indicating reprecipitation of dissolved gold over time, possibly due to low NaCN solution concentrations due to oxidation of NaCN by hydrogen peroxide and ZT Polymine.

CIL leaching with oxygen rather than air and no additives resulted in a Au recovery of 43.06% and the same conditions but $Pb(NO_3)_2$ increased the Au recovery to 46.7%.

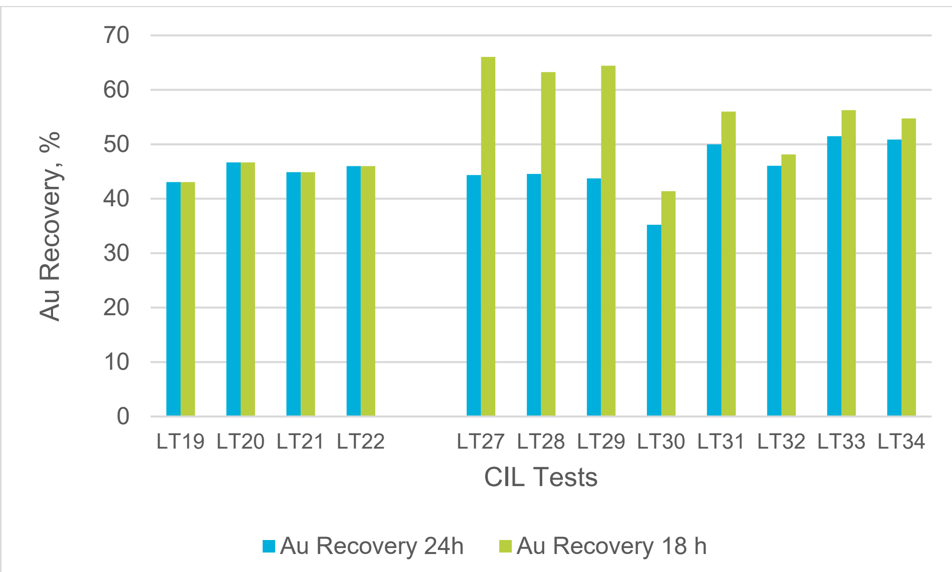
Additional testing should be performed to determine the reason for reprecipitation.

Table 13-24: Direct Carbon In Leach (CIL) Testing Under Varying Conditions

Sample Name	Grind Size, P80	Air or Oxygen	Additives	Assay Head Grade, g/t	Calc Head Grade, g/t	Leach Residence Time, h	CIL Leach Tailings, g/t	Leach Recovery, %	Leach Recovery, %	NaCN Consumption, kg/t
								48 hr	48 hr	
LT19	75	O_2		6.31	4.5	48	3.07	43.06	43.06	2.49
LT20	75	O_2	$Pb(NO_3)_2$	6.31	4.25	48	2.88	46.68	46.68	2.49
LT21	75	Air	ZT Polymine	6.31	4.43	48	2.98	44.87	44.87	3.00
LT22	75	Air		6.31	0.66	24 Flot Rejects	0.35	45.98	45.98	1.21

							24 hr	18 hr	24 hr	24 hr
LT27	75	Air	ZT 400 g/t	6.31	5.12	24	2.85	66.06	44.36	2.37
LT28	75	Air	ZT 600 g/t	6.31	4.98	24	2.76	63.25	44.55	2.28
LT29	75	Air	ZT 800 g/t	6.31	4.77	24	2.69	64.43	43.73	2.51
LT30	75	Air	H_2O_2 500 ppm	6.31	4.64	24	3.01	41.37	35.21	1.81
LT31	75	Air	ZT 250 g/t, H_2O_2 500 ppm	6.31	5.98	24	2.99	56.02	49.98	2.04
LT32	75	Air	ZT 400 g/t, H_2O_2 500 ppm	6.31	5.34	24	2.88	48.13	46.04	1.83
LT33	75	Air	ZT 600 g/t, H_2O_2 500 ppm	6.31	5.49	24	2.66	56.26	51.48	2.13
LT34	75	Air	ZT 800 g/t, H_2O_2 500 ppm	6.31	5.49	24	2.70	54.74	50.86	1.86

Figure 13-12: Au Recovery for CIL Tests Using Leach Additives



13.3.4.7 Direct CIL followed by Leaching of Flotation Tailings

Tests were performed on composite samples to determine the combined Au recovery obtained by direct CIL leaching, detoxification of the CIL tailing, flotation of the detoxified CIL tailing, CIL leaching of the flotation tailing. The conditions used included:

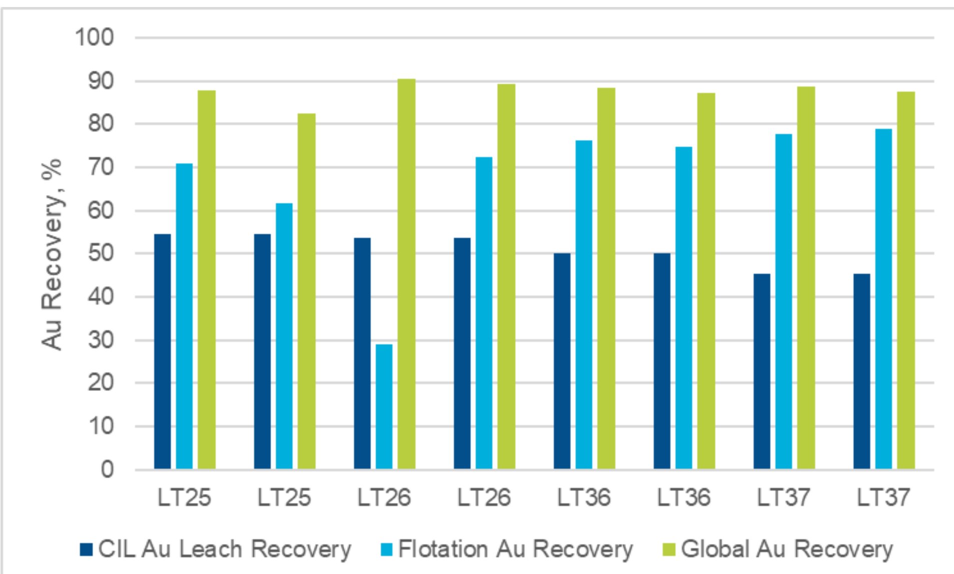
- Standard six hour pre-leach with lime, 24 hr CIL leach, detoxification, flotation of the CIL tailings
- Standard six hour pre-leach with lime, 24 hr CIL leach with 400 g/t ZT Polymine, detoxification, flotation of the CIL tailings
- Flotation conditions include: 102 g/t $CuSO_4$, 41 g/t PAX, 15 g/t SENKOL 02, 15 g/t SENKOL 08, 40 g/t INT 102

The results of the tests are presented in Table 13-25.

Table 13-25: Summary of Direct CIL Tests followed by Leaching of Flotation Tailings

	Sampl e Name	Add	Assay Head Grade, g/t	Calc Head Grade, g/t	CIL Leach Tailings, g/t	Leach Recovery, %	Flotation Mass Recovery, %	Rougher Calc Head (CIL Tail), g/t	Rougher Conc Grade, g/t	Rougher Tailings, g/t	Flotation Recovery , %	Global Recovery, %
						24 h						
LT25	FT23		6.31	5.72	2.61	54.44	15.15	2.39	11.24	0.82	70.89	87.91
LT25	FT24		6.31	5.72	2.61	54.44	14.20	2.62	11.41	1.17	61.68	82.52
LT26	FT25	ZT 400 g/t	6.31	5.43	2.53	53.49	16.49	0.74	1.29	0.63	28.90	90.34
LT26	FT26	ZT 400 g/t	6.31	5.43	2.53	53.49	17.32	2.09	8.72	0.70	72.31	89.35
LT36	FT29		6.31	5.40	2.70	50.04	18.97	2.67	10.76	0.78	76.33	88.35
LT36	FT30		6.31	5.40	2.70	50.04	24.40	2.72	8.33	0.91	74.71	87.20
LT37	FT31		6.31	5.40	2.96	45.22	19.81	2.73	10.73	0.76	77.68	88.75
LT37	FT32		6.31	5.40	2.96	45.22	19.65	3.16	12.70	0.83	78.90	87.61

Figure 13-13: Results of Combined Direct CIL, Flotation, Flotation of CIL Tailings



13.3.4.8 Rougher Flotation

Rougher flotation tests were performed on composite samples ground to 75 µm and passed through a Knelson concentrator to recover coarse gravity Au. The objective of the flotation tests was to determine the optimal reagent additions to achieve the highest Au recoveries to the flotation concentrate. The gravity recovery was determined to be 3.52% of the Au in the feed.

The maximum gold recovery and the maximum sulfur recovery to concentrate was 92.84% and 88.48% respectively. The reagent dosages used to achieve both recoveries were 100 g/t copper sulfate, ($CuSO_4$), 40 g/t potassium amyl xanthate (PAX), 15 g/t SENKOL 02, 15 g/t SENKOL 08, 40 g/t INT 102.

Table 13-26: Results of Rougher Flotation of Gravity Concentration Tailings

Sample Name	Assay Head Grade, g/t	Calc Head Grade, g/t	Gravity Recovery, %	Flotation Mass Recovery, %	Rougher Calc Head (CIL Tail), g/t	Rougher Conc Grade, g/t	Rougher Tailings, g/t	Flotation Recovery, %
Rougher Flotation - Au - Gold								
FT1	6.31	5.25	3.52	22.53	5.07	20.91	0.7	89.29
FT2	6.31	5.42	3.52	21.17	5.23	22.94	0.71	89.30
FT3	6.31	5.92	3.52	23.28	5.71	23.09	0.71	90.46
FT4	6.31	5.99	3.52	25.07	5.78	21.74	0.72	90.66
Rougher Flotation - Sulphur								
FT1	2.66	2.71		22.53		9.65	0.69	80.28
FT2	2.66	2.76		21.147		10.22	0.75	78.57
FT3	2.66	2.77		23.28		9.48	0.74	79.50
FT4	2.66	2.73		25.07		8.71	0.73	79.96
Rougher Flotation- Au								
FT5	6.31	5.84	3.52	19.33	5.63	25.83	1.05	84.97
FT6	6.31	4.27	3.52	20.02	4.12	18.22	0.77	85.05
FT7	6.31	5.48	3.52	19.3	5.29	24.94	0.83	87.33
FT8	6.31	5.52	3.52	19.58	5.33	24.43	0.91	86.26
FT9	6.31	5.58	3.52	19.31	5.38	25.83	0.74	88.91
FT10	6.31	5.52	3.52	18.16	5.33	26.63	0.83	87.25
Rougher Flotation - Sulphur								
FT5	2.66	2.82		19.33		11.13	0.82	76.54
FT6	2.66	2.82		20.02		10.78	0.83	76.46
FT7	2.66	2.74		19.3		11.14	0.73	78.50
FT8	2.66	2.93		19.58		11.25	0.91	75.02
FT9	2.66	2.78		19.31		11.2	0.76	77.94
FT10	2.66	2.93		18.16		12.15	0.88	75.42
Rougher Flotation- Au								
FT11	6.31	5.45	3.52	26.9		18.94	0.53	92.88
FT12	6.31	5.45	3.52	24.42		20.28	0.64	91.08
FT13	6.31	5.45	3.52	25.33		19.07	0.75	89.63
FT14	6.31	5.45	3.52	25.93		18.65	0.8	89.12
Rougher Flotation - Sulphur								
FT11	2.66	2.68		26.9		8.82	0.42	88.48
FT12	2.66	2.68		24.42		8.75	0.72	79.81
FT13	2.66	2.73		25.33		8.75	0.68	81.28
FT14	2.66	2.77		25.93		8.65	0.72	80.81

Sample Name	Assay Head Grade, g/t	Calc Head Grade, g/t	Gravity Recovery, %	Flotation Mass Recovery, %	Rougher Calc Head (CIL Tail), g/t	Rougher Conc Grade, g/t	Rougher Tailings, g/t	Flotation Recovery, %
Rougher Flotation- Au								
FT15	6.31	5.45	3.52	22.83		19.54	0.78	88.14
FT16	6.31	5.45	3.52	23.05		19.94	0.82	87.89
FT17	6.31	5.45	3.52	20.73		22.03	0.87	86.94
FT18	6.31	5.45	3.52	20.72		22.06	0.83	87.41
FT19	6.31	5.45	3.52	17.97		23.96	0.86	85.96
FT20	6.31	5.45	3.52	18.65		24.44	0.88	86.49
Rougher Flotation - Sulphur								
FT15	2.66	3.15		22.83		12.16	0.49	88.1
FT16	2.66	2.8		23.05		9.58	0.76	78.96
FT17	2.66	2.81		20.73		10.38	0.83	76.55
FT18	2.66	2.84		20.72		10.56	0.82	77.03
FT19	2.66	2.82		19.97		11.65	0.89	74.23
FT20	2.66	2.78		18.65		11.31	0.83	75.83

13.3.4.9 Flotation and CIL Leaching of the Flotation Concentrate

Flotation tests were performed on composite samples to generate flotation concentrate sample to determine the effect of ZT Polymine polymer on the CIL leaching of flotation concentrate. The results of the tests are presented in Table 13-27. The results indicated no difference between the two tests with global recoveries of FT27 and FT28 of 38.08% and 39.3% respectively.

The conditions used were:

- Flotation with were 102 g/t copper sulfate, ($CuSO_4$), 41 g/t potassium amyl xanthate (PAX), 15 g/t SENKOL 02, 15 g/t SENKOL 08, 40 g/t INT 102
- Leaching of the flotation concentrate with 24 hr CIL leach with 250g/t ZT Polymine.
- Leaching of the flotation concentrate with 24 hr CIL leach with no additives.

Table 13-27: CIL Leaching of Flotation Concentrate

Sample Name	Assay Head Grade, g/t	Flotation Mass Recovery, %	Rougher Calc Head, g/t	Rougher Conc Grade, g/t	Rougher Tailings, g/t	CIL Leach Tailings, g/t	Leach Recovery, %	Flotation Recovery, %	Global Recovery, %	NaCN Cons, kg/t
FT27	6.31	20.45	5.4	23.35	0.78	13.17	43.61	88.46	38.08	2.426
FT28	6.31	19.47	5.4	24.2	0.85	14.42	40.41	87.26	39.30	3.182

13.3.4.10 Mini Pilot Plant Concentration of Au Bearing Sulfide Minerals by Continuous Flotation

Flotation testing was performed on a composite sample of Faina refractory sulfide mineralized material by the Center of Mineral Technology (CETEM) in January 2023. The objective of the study was to determine methods for concentrating gold bearing sulfide minerals by flotation for possible sale to third party smelters or pressure oxidation processing facilities.

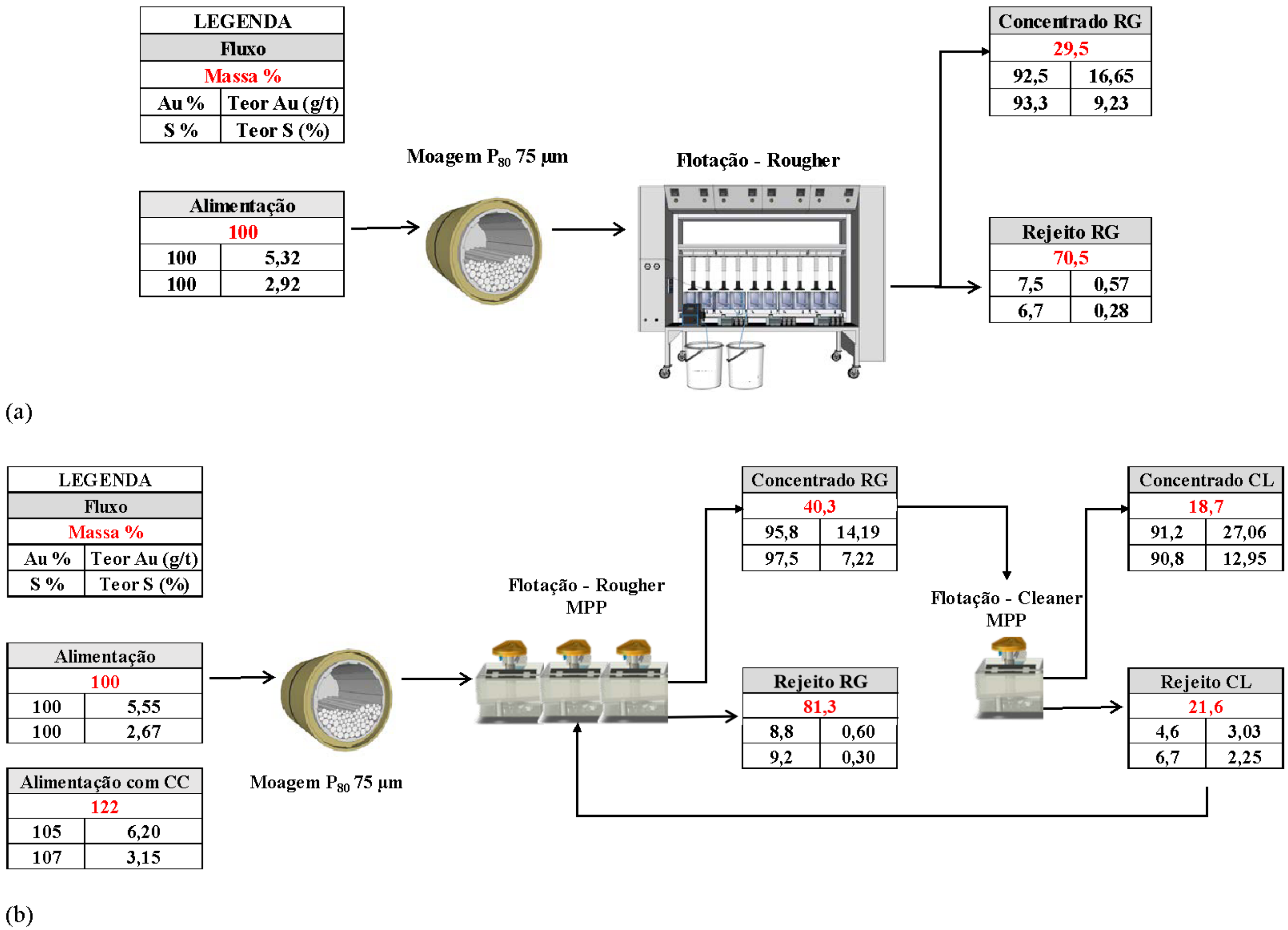
The tests were performed in a continuously operated mechanical flotation apparatus. Different flotation circuit configurations were investigated including RG, RG/CL, RG/CL and RG/CL and RCL. The objectives of the tests were to determine the Au and S metallurgical recoveries, concentrate grades and the most favorable reagent combinations and dosages. The test parameters were determined by previous metallurgical testing. All samples were ground to 75 µm which was determined to be the optimum particle size, conditioned at 50% solids and floated at 30% solids. The natural pH of the pulp was 8.5 and the flotation pH was 8.9. A summary of the mini pilot plant test results is provided in Table 13-28. The process flow diagram for the rougher and rougher/cleaner pilot plant test configurations is presented in Figure 13-14.

Table 13-28: Results of Faina Mini Pilot Plant Continuous Au Bearing Sulfide Flotation Studies

	Activator: $CuSO_4$, g/t	Collector: Senkol 8, g/t	Collector: PAX, g/t	Frother: Senfroth, g/t	Final Con Mass Recovery, %	Au Grade, g/t	Sulfur Grade, %	Au Recovery, %	S Recovery, %	Tailings Grade, Au, g/t	Tailings Grade, S, %	Au Rec to Tailings, %	S Rec to Tailings, %
1	122	34	48	49	48.6	9.6	5.1	94.6	96.0	0.52	0.20	5.4	4.0
2	122	34	48	50	42.3	8.8	5.8	94.8	95.3	0.55	0.21	5.2	4.7
3	118	33	47	48	44.4	9.1	5.8	93.4	95.0	0.52	0.24	6.6	5.0
4	118	33	47	48	45.0	9.2	6.0	93.6	95.4	0.51	0.24	6.4	4.6
5	112	32	44	45	41.9	11.1	5.9	94.2	95.7	0.49	0.19	5.8	4.3
6	54	19	28	38	31.3	15.7	8.6	91.4	92.7	0.67	0.31	8.6	7.3
7	53	18	27	37	31.5	14.3	8.4	91.0	92.3	0.65	0.32	9.0	7.7
8	52	18	27	36	29.7	15.8	8.6	89.6	92.6	0.78	0.29	10.4	7.4
9	55	19	29	39	30.4	14.9	8.5	89.6	93.3	0.76	0.27	10.4	6.7
10	58	14	25	40	29.5	16.7	9.2	92.5	93.3	0.57	0.28	7.5	6.7
11	57	23	13	38	17.6	23.6	14.1	91.2	90.4	0.54	0.32	8.8	9.6
12	54	22	13	36	18.5	25.1	13.5	91.4	90.9	0.52	0.31	8.6	9.1
13	55	22	13	37	19.7	21.8	12.8	94.0	91.6	0.38	0.29	6.0	8.4
14	56	22	13	37	20.1	22.2	12.4	91.7	91.0	0.52	0.31	8.3	9.0
15	56	13	19	37	20.3	20.1	12.6	93.6	92.9	0.41	0.25	6.4	7.1
16	56	22	13	37	21.1	20.6	12.1	92.8	92.5	0.46	0.26	7.2	7.5
17	57	23	13	38	17.3	29.7	14.4	86.8	89.7	0.94	0.35	13.2	10.3
18	54	22	13	36	18.3	28.8	13.6	85.7	91.9	1.08	0.27	14.3	8.1
19	56	22	13	37	19.8	27.2	12.9	86.9	90.8	1.01	0.32	13.1	9.2
20	55	22	13	37	19.6	26.9	12.8	90.6	90.6	0.68	0.32	9.4	9.4
21	54	13	18	36	19.7	26.3	12.9	90.8	91.4	0.66	0.30	9.2	8.6
22	54	22	13	36	21.0	24.7	12.0	92.4	91.7	0.54	0.29	7.6	8.3

	Activator: $CuSO_4$, g/t	Collector: Senkol 8, g/t	Collector: PAX, g/t	Frother: Senfroth, g/t	Final Con Mass Recovery, %	Au Grade, g/t	Sulfur Grade, %	Au Recovery, %	S Recovery, %	Tailings Grade, Au, g/t	Tailings Grade, S, %	Au Rec to Tailings, %	S Rec to Tailings, %
23	64	15	27	42	24.6	22.6	12.7	91.8	94.0	0.51	0.21	8.2	6.0
24	57	13	24	38	25.1	21.9	11.0	90.6	91.3	0.59	0.31	9.4	8.7
25	54	13	22	36	21.8	20.4	11.1	90.7	92.7	0.59	0.26	9.3	7.3
26	56	13	23	37	23.0	21.2	11.1	89.8	91.7	0.64	0.30	10.2	8.3
27	60	14	25	40	24.6	21.7	10.8	91.6	91.7	0.65	0.32	8.4	8.3
28	60	14	25	40	25.1	18.1	10.0	87.1	92.3	0.90	0.28	12.9	7.7
29	56	9	18	37	21.8	20.9	11.6	87.8	94.0	0.81	0.21	12.2	6.0
30	59	10	19	39	23.0	21.5	11.3	85.8	93.9	1.07	0.22	14.2	6.1

Figure 13-14: Process Flow Diagram for Continuous Rougher (a) and Rougher/Cleaner (b) MPP



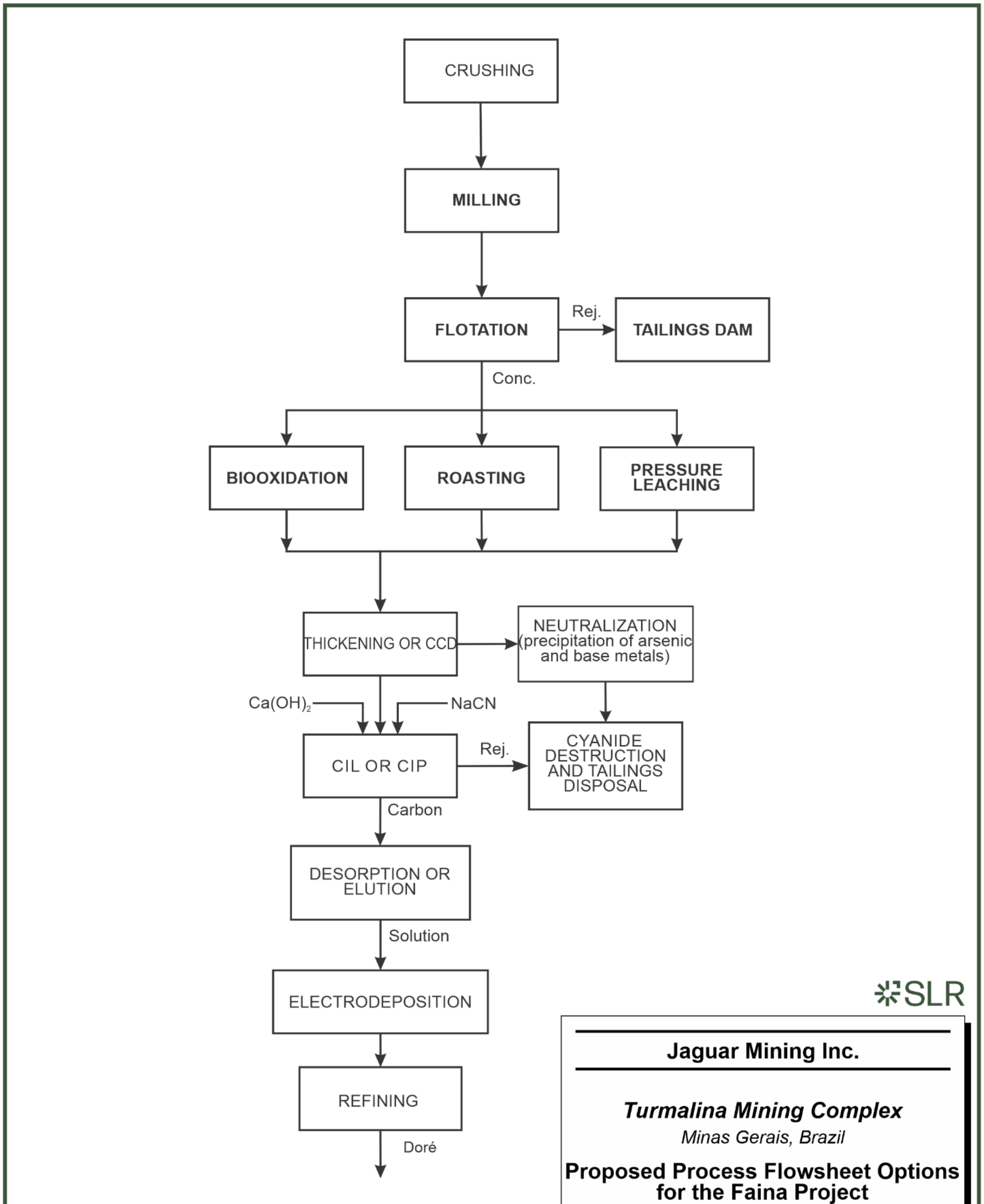
13.3.4.11 Faina Refractory Gold – Pressure Oxidation Test Program

A refractory gold test program was performed by Sherritt Technologies, a division of Sherritt International Corporation. The results were reported in the report “Faina Refractory Gold Project, Batch Test Program Report. May 2023”. The program included batch and pilot testing of concentrates received from Mineracao Serras Do Oeste Limitada (MSDOL) from the Faina deposit for amenability to pressure oxidation for the oxidation of sulfides followed by cyanidation for extraction and recovery of gold. The test work investigated each of the unit operations including flotation, acidulation, pressure oxidation (POX), neutralization of POX solids, settling tests on acidulation solids and POX residue, cyanidation of POX residue solids and direct cyanidation of flotation concentrates.

For these tests, the following was observed:

- Over 98% sulphide oxidation in pressure oxidation was achieved within 40 minutes for all concentrate samples tested.
- Greater than 98% gold extraction in cyanidation was reached in 20 minutes for all feed and solution combinations tested, except for Test RC-2 where 98% was reached in 40 min.
- Extraction of over 98% of the gold typically occurred when the sulphide oxidation was greater than 95%.

Figure 13-15: Proposed Process Flowsheet Options for the Faina Project



Source: Modified from TDP, 2023.

13.4 Pitangui Metallurgical Testing Program (2014-2016)

This section was imported and modified from the "Final Report, Preliminary Economic Assessment for the Pitangui Gold Project, Brazil, Pitangui Gold Project, Minas Gerais State, Brazil, IAMGOLD Corporation" (SRK, 2021_.

13.4.1 Introduction

Test work programs on Pitangui samples were completed by SGS Minerals Services (SGS), Lakefield, Ontario in 2014 and ALS Metallurgy (ALS), Kamloops, British Columbia in 2016. Complete details of the test work results are summarized in final reports issued by both independent laboratories (SGS 2014, ALS 2016). SGS conforms to the requirements of the ISO/IEC 17025 standard for specific registered tests. ALS is accredited in ISO 9001, 14001, and 45001.

The work focused on measuring sample grades and composition, followed by comminution testing and gold recovery using gravity, flotation, and cyanide leaching. Acid Base Accounting (ABA) testing was also performed on head and tailings samples to estimate the potential for acid generation.

13.4.2 Sample Details

SGS reported receiving two ½ core composite samples of unknown origin for metallurgical evaluation (Comp 1 and Comp 2). In addition, they received three lower-grade samples for ABA evaluation.

ALS reported receiving ¼ core samples of unknown origin from which three intervals were selected for variability testing (referred in this section as 'low', 'medium' and 'high-grade'). After removing these intervals, all the remaining material was combined into a Master composite used for comminution and preliminary recovery test work.

13.4.3 Head Assays

The two composites evaluated by SGS in 2014 were relatively high in sulphides (S^{-2}) and low in arsenopyrite (as shown by % As in Table 13-29) with gold grades of 5.6 g/t and 12.3 g/t.

Table 13-29: 2014 Sample Head Assays

Sample	Au, g/t	Fe, %	S^{2-}	Cu, %	As, %
Comp 1	5.6	26.3	17.0	0.08	0.029
Comp 2	12.3	24.1	13.4	0.0	-

Source: SRK, 2021

The three intervals and Master composite tested by ALS in 2016 had higher S and As levels and also covered a wide range of Au grades (2.3 g/t to 9.2 g/t), as listed in Table 13-30. The December 2015 historical resource estimate for Pitangui reported an average grade of 5 g/t Au, at a cut-off grade of 2.5 g/t Au, which agrees with the Master composite sample. (SRK, 2021)

The presence of sulphides (e.g., mainly pyrrhotite and arsenopyrite) in the samples likely indicates a refractory response to cyanide leaching. Consequently, ALS looked at bulk flotation to concentrate the sulphides prior to cyanide leaching. In addition, both test work programs included ABA evaluations to measure the tendency for acid generation from the plant tailings.

Table 13-30: 2016 Sample Head Assays

Sample	Au, g/t	Fe, %	S^{2-}	Cu, %	As, %
Master	5.04	24.0	9.18	-	0.86
Low-grade	2.26	24.8	8.14	0.15	1.07
Med-grade	5.82	19.4	5.14	0.03	0.17
High-grade	9.16	26.1	14.8	0.05	1.01

Source: SRK, 2021

13.4.4 Mineralogy

SGS conducted a diagnostic leach test to determine gold occurrence and association. ALS performed quantitative mineralogy, QEMSCAN, on the three variability samples and Master composite. Table 13-31 presents the resulting mineral composition of the samples.

Table 13-31: Mineral Composition of 2016 Pitangui Samples

Mineral Percentage	Master	Low-grade	Med-grade	High-grade
Pyrite	0.8	0.9	0.2	1.5
Pyrrhotite	23.1	16.1	11.8	31.2
Arsenopyrite	1.7	3.0	0.6	2.6
Other sulphides	0.2	0.5	0.1	0.2
Iron Oxides	8.5	10.9	8.4	1.6
No-sulphide Gangue	65.7	68.6	78.9	62.9
Total	**100**	**100**	**100**	**100**

Notes:

1. Other sulphides include galena, sphalerite and molybdenite
2. Iron oxides include magnetite, hematite, goethite, and limonite
3. Non-sulphide gangue includes quartz, micas, feldspar, chlorite and carbonates

Source: SRK, 2021.

The main sulphide minerals were pyrrhotite (12% to 31%) with variable levels of arsenopyrite (0.6% to 3.0%) and a limited amount of pyrite (up to 1.5%). Iron oxides such as magnetite, hematite, goethite, and limonite were present at reasonable levels except for the high-grade sample. Pyrrhotite is recognized as being associated with refractory ore, with a high oxygen demand resulting in oxygen depletion in the pulp and reducing the rate of gold dissolution by cyanide.

13.4.5 Diagnostic Leach

SGS performed diagnostic leach tests on both Comp 1 and Comp 2 to examine gold deportment. The results indicated that >93% of the gold was available for gravity or intensive cyanide recovery. Gravity recoverable gold was 27% to 34%. Association with sulphides (pyrrhotite, pyrite and/or arsenopyrite) was another 4% with around 0.5% locked with silicates. Therefore, some 99% of the gold could be recovered through cyanide leaching, provided oxygen and cyanide concentrations were maintained.

ALS performed a Davis Tube separation on the Master composite to identify the magnetic portion of the sample. Only 1% of the gold was recovered with 5% of the sulphide to a magnetic concentrate. However, the concentrate grade was 67% Fe, indicating mainly iron oxides were recovered.

13.4.6 Comminution Test Work

Tests were conducted by both SGS and ALS on the main samples for hardness or comminution response. Table 13-32 summarizes the results in terms of impact breakage (DWi from an SMC test), grindability (Bond Ball Mill Work Index, BWi) and Bond abrasivity (Ai).

Table 13-32: Comminution Test Summary

Mineral	SG	DWi, kWh/m3	BWi, kWh/t	BWi Closing Screen Size, µm	Ai, g
SGS Comp 1	3.39	6.81	10.1	106	0.486
SGS Comp 2	3.20	6.68	11.5	106	0.432
ALS Master	3.10	9.42	11.0	106	

Source: SRK, 2021

The sulphide and iron oxide content are reflected in the relatively high specific gravity with the ALS Master composite reporting a much higher DWi value. All samples reported low BWi values ranging from 10.1 kWh/t to 11.5 kWh/t at a closing screen size of 106 µm. Subsequent recovery test work indicated a relatively fine primary grind 80% passing size (P80) resulted in higher gold extraction. What is significant is the relatively high Ai values – reflecting the almost 40% silica observed in the ALS samples.

Part of the ALS investigation included rougher flotation followed by cyanide leaching. An estimate of regrind specific energy requirements was made using the Eliason test – developed by ALS using smaller sample masses compared to an IsaMill signature plot. The test result indicated a specific energy requirement of 21 kWh/t for rougher concentrate from a P80 of 61µm to a product P80 of 27 µm.

13.4.7 Recovery Test Work

Different recovery methods were investigated by SGS and ALS, with SGS focusing on Whole Ore Leaching (WOL) while ALS included separate gravity, rougher flotation followed by cyanidation of the products as well as a WOL evaluation.

For both laboratories, the final flowsheet selected for Pitangui samples was WOL. Gravity recovery was not included in the final flowsheet due to inconsistent results at the relatively fine primary grind size selected and similar overall recoveries being achieved without gravity.

13.4.8 Gravity Concentration

SGS conducted Knelson concentrator recovery work as part of diagnostic leach testing on both composites. The Gravity Recoverable Gold (GRG) fraction from Knelson concentration at a grind

P_{80} size of 75 µm was 27 to 34%. This was on samples with significantly higher sulphide content than the ALS samples tested in 2016.

The Master composite was tested by ALS at grind P_{80} sizes of 89 µm and 67 µm as shown in Table 12-5. With the finer grind, gold recovery to around 5% of the mass increased from 28 to 34%. A considerable loss of gold occurred when panning this down to a final concentrate and removing the pyrrhotite and pyrite fraction.

Table 13-33: Gravity Concentration Results - 2016 Master Composite

Primary Grind, P80, µm	Product	Mass Recovery, %	S, %	Au , g/t	S Distribution, %	Au Distribution, %
89	Pan Con	1.4	21.1	57.2	3.2	16.3
89	Knelson Con	5.1	17.1	27.1	9.4	28.0
89	Knelson Tails	94.9	8.78	3.72	90.6	72.0
67	Pan Con	1.2	21.3	91.0	2.7	22.1
67	Knelson Con	5.2	19.5	32.1	11.0	34.2
67	Knelson Con	94.8	8.62	3.36	89.0	65.8

Source: SRK, 2021.

As the overall recovery of gold did not improve, ALS continued the remainder of their recovery test work without gravity concentration.

13.4.9 Flotation & Product Leaching

ALS conducted several rougher sulphide flotation tests on the Master composite. The results are reported in Table 13-34.

Table 13-34: Rougher Flotation - 2016 Master Composite

Primary Grind, P80, µm	PAX, g/t	CuSO4, g/t	Mass Recovery, %	S Recovery, %	Au Recovery, %	Tails Sulphur Grade, %	Tails Au Grade, g/t
89	20	-	26.8	89.7	83.0	1.30	1.12
67	20	-	27.0	88.0	86.1	1.51	0.92
67	80	-	29.2	93.2	88.0	0.86	0.86
135	80	-	29.4	92.8	79.9	0.93	1.40
135	80	700	31.6	96.5	81.7	0.48	1.27
67	80	500	29.6	97.0	88.5	0.38	0.81
67	80	500	25.8	94.5	86.0	0.68	0.94

The test results indicate that Au and sulphur recovery was dependent on primary grind size, with the finer P80 of 67 µm resulting in the highest recovery of both sulphur and gold.

The flotation products were both subjected to cyanide leaching with the rougher tailings reporting 76% to 77% gold extraction and the rougher concentrate reporting 43% to 97% extraction, depending on oxygen levels. Provided adequate dissolved oxygen could be maintained, combined leaching of both flotation products (at grind P80 sizes of 25 µm to 67 µm) could achieve 95% gold extraction from the Master composite.

However, costs associated with rougher flotation, concentrate regrinding, and leaching of both products are significantly higher than the WOL option and therefore ALS continued to investigate the latter as the preferred flowsheet.

13.4.10 Whole Ore Leaching

SGS conducted WOL testing on both composites over 48 to 52 hours at pH 10.5 to 11 with 0.5 g/L or 1.0 g/L NaCN concentration levels. Pre-aeration was done using air or pure oxygen from 2 to 18 hours before leaching. The addition of lead nitrate ($PbNO_3$) at 0.25 kg/t to form a hydroxide layer on pyrite (and possibly pyrrhotite) particles had limited effect. Table 13-35 summarizes the results of the SGS WOL testing on Comp. 1 and Comp. 2.

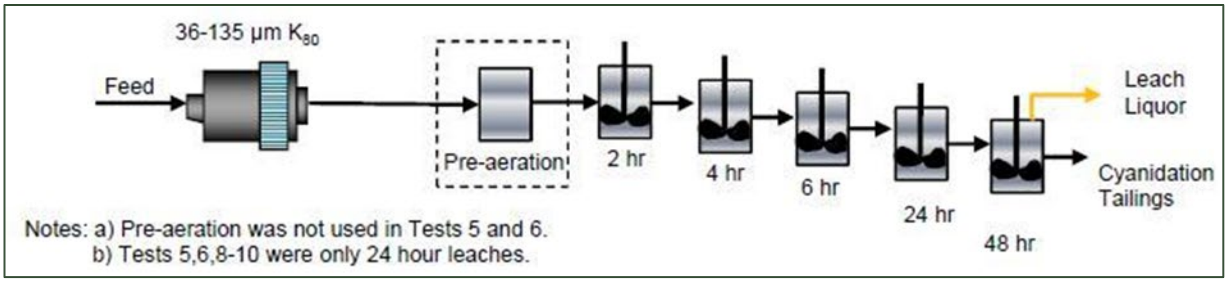
Table 13-35: 2014 SGS Whole Ore Leach

Composite	Grind Size, P80, µm	NaCN Cons, kg/t	CaO Cons, kg/t	Au Calc Head, g/t	Au in Residue, g/t	Au Extraction, %
1	50	3.6	1.6	5.39	0.26	95.3
1	71	2.6	1.3	5.39	0.36	93.3
1	71	1.4	16	5.06	0.34	93.3
1	102	2.3	1.0	5.39	0.62	88.6
2	52	3.7	1.4	11.5	0.42	96.4
2	74	3.1	1.2	11.4	0.64	94.5
2	74	1.3	1.5	11.9	0.56	95.3
2	103	3.1	1.2	11.6	1.12	90.4

The gold residue grades, and cyanide consumptions were sensitive to primary grind size in both composites. Calculated gold extractions ranged from 89% to 96% for the two samples. Lime consumption was relatively constant at 1.0 kg/t to 1.6 kg/t.

In 2016, ALS continued the investigation of Whole Ore Leaching on the Master composite before testing the preferred conditions on the three variability samples. The WOL flowsheet used by ALS is shown in Figure 13-16.

Figure 13-16: ALS Lab Flowsheet for Whole Ore Leach Testing



Source: ALS, 2016.

The results of the WOL testing on the Master composite are summarized in Table 13-36with two test conditions used: "A" for shorter leach time and lower cyanide concentration and "B" at a slightly higher pH, NaCN concentration and double the leach time. (One "B" test included the addition of lead nitrate.)

Table 13-36:   ALS Whole Ore Leach of the 2016 Master Composite

Test Conditions	Grind Size, P80, µm	Pre-Aeration, hr	O2 Depleted?	NaCN Cons, kg/t	CaO Cons, kg/t	Au Extraction, %	Au Residue, g/t
A	89	0	Yes	3.0	0.3	86.6	0.68
A	67	0	Yes	4.3	0.2	82.8	0.92
A	89	24	No	0.8	0.7	87.7	0.64
A	67	24	No	0.9	0.7	90.4	0.49
A	135	24	No	0.7	0.6	82.9	0.90
A	36	20	Yes	5.2	0.7	65.8	1.87
B	36	41	No	4.2	4.0	96.5	0.18
B	36	41	No	3.6	3.5	96.2	0.19
B	36	41	No	3.0	3.9	95.8	0.21
B	52	41	No	3.4	2.6	94.6	0.28

A Test Conditions: pH 10.5, NaCN Conc 1 g/L, Leach Time 24 hours

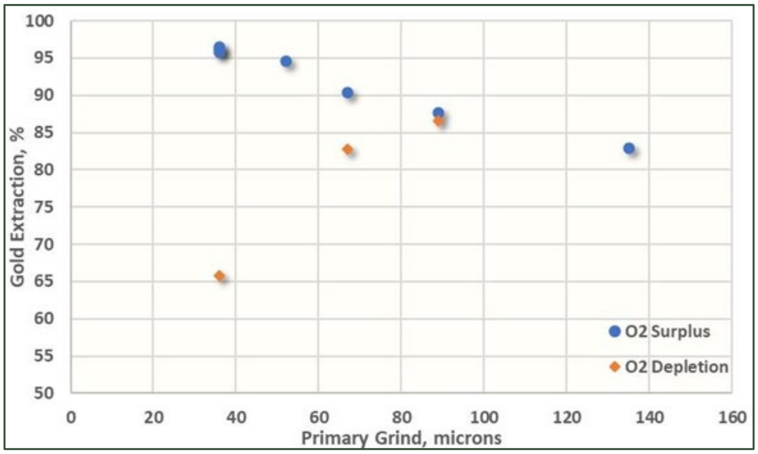
B Test Conditions: pH 11.0, NaCN Conc 2 /L, Leach Time 48 hours, 200 g/t $Pb(NO_3)_2$ Added

Source SRK, 2021

In a few tests, oxygen depletion occurred even with 20 hours of pre-aeration using oxygen. This had a significant effect on gold extraction as shown in Figure 13-17, with fine grinding of the pyrrhotite resulting in greater oxygen demand. When there was a surplus of oxygen, the effect of grind size was consistent, with 41 hours of pre-aeration proving to be adequate for all grind sizes tested.

A combination of extended pre-aeration with a 36 µm to 52 µm primary grind size, resulted in an approximate 95% gold extraction for the Master composite. Under these conditions, cyanide consumption was 3.0 to 4.2 kg/t with lime consumption at similar levels.

Figure 13-17: Whole Ore Leach Extraction vs. Primary Grind (O_2 surplus/depletion)



Source: SRK, 2021

These conditions were evaluated on the three variability samples with the results summarized in Table 13-37. A 2 g/L NaCN concentration was maintained resulting in gold extraction ranging from 91% to 96% as head grades increased. Cyanide consumptions ranged from 4.1 kg/t to 6.0 kg/t and lime consumptions held steady between 4.3 kg/t and 4.7 kg/t.

Table 13-37: ALS Whole Ore Leach – 2016 Variability

Composite	Grind Size, P80, µm	Pre-Aeration, h	O_2 Depleted?	NaCN Cons, kg/t	CaO Cons, kg/t	Au Extraction, %	Au Residue, g/t
Low Grade	43	41	No	6.0	4.3	91.4	0.23
Medium Grade	43	41	No	4.1	4.7	94.0	0.35
High Grade	41	41	No	5.2	4.4	96.0	0.37

Conditions: pH 11, NaCN 2g/L, Leach Time 48 hours

Source SRK, 2021

In establishing plant design criteria, a primary grind size of 53 µm was selected along with extended pre-aeration followed by 24 hours of leach residence time. Kinetic samples showed gold leaching was almost completed after 8 hours, provided adequate O_2 and NaCN levels could be maintained. Cyanide and lime consumptions of 3 kg/t were selected, based on Master composite test results.

13.4.11 Acid Base Accounting

SGS evaluated both Comp 1 and Comp 2 for acid-generation and neutralization potential (NP) for both head samples as well as leach residues. The results are presented in Table 13-38. The results indicated that both head and residues have a strong potential for acid generation with NP/MPA ratios of less than 1.0 and acidic final pH values.

Table 13-38: SGS 2014 Acid Base Accounting Results

Sample	Sulphur, %	MPA	NNP	NP	NP/MPA
Comp 1 Head	17.8	320	-232	89	0.28
Comp 2 Head	13.8	222	-44	179	0.80
Comp 3 Head	11.2	198	-76	122	0.62
Comp 4 Head	15.4	233	-128	105	0.45
Comp 5 Head	14.8	152	-20	132	0.87
Comp 1 CN Tails	17.0	396	-299	97	0.24
Comp 2 CN Tails	14.2	338	-224	114	0.34

Notes: MPA = Maximum Potential Acidity, NNP=Net Neutralizing Potential, NP=Neutralizing Potential, All units are tonnes carbonate per 1,000 tonnes of material.

Source SRK, 2021

Similarly, ALS performed ABA testing in 2016 on leach residues from both the Master composite and variability samples. The results are presented in Table 13-39. The results also demonstrated acid generating potential with NP/MPA ratios at 1.06 or below.

Table 13-39: ALS 2016 Acid Base Accounting Results

Sample	Sulphur, %	MPA	NNP	NP	NP/MPA
Master	8.63	270	-94	176	0.65
Master	8.84	276	-110	166	0.60
Med Grade	4.94	154	10	164	1.06
High Grade	13.6	425	-248	177	0.42
Low Grade	7.68	240	-68	172	0.72

Notes: MPA = Maximum Potential Acidity, NNP=Net Neutralizing Potential, NP=Neutralizing Potential, All units are tonnes carbonate per 1,000 tonnes of material.

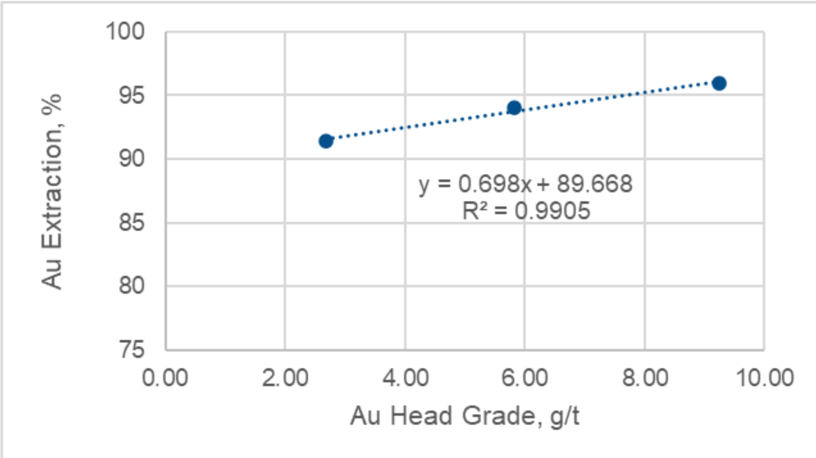
Source SRK, 2021

13.4.12 Plant Performance Estimates

For estimating plant gold extractions, the ALS variability sample results were used as they showed a consistent effect of head grade. A plot of the gold head grade versus gold recovery results from the variability tests is presented in Figure 13-18. It is assumed the plant will operate a WOL circuit with adequate pre-aeration to sustain dissolved oxygen levels and will provide at least a 24-hour leach residence time. Primary grind size should be 80% passing 53 µm or finer with the provision to add lead nitrate as required.

Pitangui mineralized material contains significant amounts of pyrrhotite, which is a highly reactive sulphide mineral and a major NaCN and oxygen consumer contributing to high cyanide and lime consumption. NaCN consumption in the ALS variability sample tests ranged from 4.1 kg/t to 6 kg/t and the average consumption in the Master Composite tests was 3.55 kg/t NaCN. An estimate of 3 kg/t for both reagents is assumed in the preliminary economic assessment plant operating cost estimate completed by SRK (2021).

Figure 13-18: Whole Ore Leach Extraction vs. Head Grade (ALS Variability)



Source: SRK, 2021

There are no known processing factors or deleterious elements that could have an affect on potential economic extraction.

14.0 Mineral Resource Estimates

14.1 Introduction

The current Mineral Resource estimates for the MTL Complex comprise updates of the previous Mineral Resource estimates for the Turmalina Mine, the Faina Deposit, and the former LB1 and LB2 zones at the Pontal deposit. The current Pontal Mineral Resource estimate includes a first-time estimate of the newly discovered mineralized zone located in 2023 along the southeastern strike projection of the previously known mineralization, known as the Pontal South deposit.

The current Mineral Resource estimate also includes the first-time disclosure of the estimation methods used to prepare the Mineral Resource estimate for the newly discovered mineralization at the Zona Basal deposit. This deposit is located approximately three kilometres to the west of the Turmalina Mine and was discovered by Jaguar's exploration team as a result of trenching and drilling programs carried out in 2020 and 2021.

The current Mineral Resource estimate also includes the São Sebastião deposit, located approximately 20 km to the east of the Turmalina Mine. This deposit was recently acquired by Jaguar in September 2023.

SLR has audited and accepted the Turmalina, Faina, Pontal, and Zona Basal Mineral Resource estimates prepared by Jaguar. SLR has also audited and accepted the block model prepared by SRK Consulting for the São Sebastião deposit. SLR prepared updated Mineral Resource statements for the São Sebastião deposit using updated gold prices and newly created reporting panels in order to meet the "Reasonable Prospects for Eventual Economic Extraction" (RPEEE) requirement of the CIM (2014) definitions.

Table 14-1 summarizes the Mineral Resource estimates based on a US$1,800/oz Au price for the Turmalina Mine, Faina, Pontal, Zona Basal, and São Sebastião deposits. Mineral Resource estimates were prepared for the Turmalina Mine and the Faina, Pontal, and São Sebastião deposits based upon the conceptual view that the mineralized material would be extracted using underground mining methods. The Mineral Resource estimate for the Zona Basal deposit was prepared using a conceptual view that the mineralized material would be extracted principally by means of open pit mining methods.

The total combined Mineral Resources for the five deposits comprising the MTL Complex are estimated to total approximately 8.50 Mt at an average grade of 4.23 g/t Au in the Measured and Indicated Mineral Resource categories (approximately 1.16 Moz Au). An additional amount of approximately 7.64 Mt at an average grade of 3.58 g/t Au (approximately 0.88 Moz Au) is estimated to be present in the Inferred Mineral Resource category. The RPEEE requirement of the CIM Definition Standards for Mineral Resources were met for the Turmalina Mine and the Faina, Pontal, Zona Basal, and São Sebastião deposits by means of either applying reporting panels, clipping polygons, or open pit resource shells as constraints when preparing the Mineral Resource statements.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

Table 14-1: Summary of Mineral Resources for the MTL Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Turmalina Mine (Underground, Effective Date: July 31, 2023)			
Measured	1,691	4.73	257
Indicated	1,688	3.46	188
Total Measured and Indicated	***3,379***	***4.10***	***445***
Inferred	1,272	3.25	133
Faina Deposit (Underground, Effective Date: March 30, 2023)			
Measured	0	0	0
Indicated	1,427	5.08	233
Total Measured and Indicated	***1,427***	***5.08***	***233***
Inferred	1,420	5.09	232
Pontal Deposits (Underground, Effective Date: November 30, 2023)			
Measured	0	0	0
Indicated	266	3.44	29
Total Measured and Indicated	***266***	***3.44***	***29***
Inferred	828	3.94	105
Zona Basal Deposit (Open Pit, Effective Date: December 31, 2022)			
Measured	0	0	0
Indicated	0	0	0
Total Measured and Indicated	***0***	***0***	***0***
Inferred	781	1.28	32
São Sebastião Deposit (Underground, Effective Date: November 30, 2023)			
Measured	0	0	0
Indicated	3,423	4.07	448
Total Measured and Indicated	***3,423***	***4.07***	***448***
Inferred	3,343	3.53	379
Total			
Measured	1,691	4.73	257
Indicated	6,804	4.10	898
Total Measured and Indicated	***8,495***	***4.23***	***1,155***
Inferred	7,644	3.58	881

Notes:

1. CIM (2014) definitions were followed for the classification of Mineral Resources.
2. Mineral Resources are inclusive of the Mineral Reserves at Turmalina and Faina. No Mineral Reserves are currently present at the Pontal, Zona Basal, or São Sebastião deposits.

3. Mineral Resources are estimated at a cut-off grade of 1.79 g/t Au at Turmalina, 2.65 g/t Au at Faina, 3.0 g/t Au at Pontal, 0.75 g/t Au at Zona Basal and 2.25 g/t Au at São Sebastião.
4. Mineral Resources at the Turmalina deposit include all drill hole and channel sample data as of September 13, 2022, and are depleted using mining excavations as of July 31, 2023. Mineral Resources at the Faina and Pontal deposits include drill hole information as of September 9, 2022. Mineral Resources at the Zona Basal deposit include drill hole information current as of August 25, 2022. Mineral Resources at the São Sebastião deposit include drill hole information current as of July 29, 2019.
5. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au for the Turmalina, Faina, Pontal, and Zona Basal deposits and US$1,500/oz Au for the São Sebastião deposit.
6. Mineral Resources are estimated using an average long term exchange rate of R$5.20:US$1.00 for the Turmalina, Faina, Pontal, Zona Basal and São Sebastião deposits.
7. Minimum widths of approximately 2.0 m were used for Turmalina, Faina, Pontal, and Zona Basal. A minimum height of 2 m was applied to São Sebastião using reporting panels.
8. Gold grades are estimated by the ordinary kriging (OK) interpolation algorithm using capped composite samples.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

14.2 Turmalina Deposit

14.2.1 Resource Database

Jaguar maintains a central database using the MX Deposit software, which is used to store and manage all of the digital information for all of its operations. The drill hole database contains drill hole and channel sample information, coded according to the naming conventions provided in Table 14-2.

Table 14-2: Drill Hole Database Naming Convention, Turmalina Deposit

Hole Series	Description
CN	Grade Control Channel Samples
FSN	Jaguar Drill Holes, Orebody C
FMT	Jaguar Drill Holes, Orebodies A and B
FTS	Jaguar Drill Holes
LM	Jaguar Drill Holes
FC	Jaguar Drill Holes
JM/JMB[1]	Jumbo Drill Holes
SMB[1]	Blast Holes (open pits)
TR	Trench Samples

Note:

1. JM-series and SMB-series drill hole and assay information are not used for construction of mineralized wireframes or grade estimation purposes.

The drill hole and channel sample information for the Turmalina deposit was extracted from this internal database into separate files for use in preparation of the Mineral Resource estimates. The cut-off date for the drill hole database is September 13, 2022. The drilling and sampling data was carried out using the UTM Datum Córrego Alegre, Zone 23S grid coordinate system.

A summary of the drilling and channel sampling information used to prepare the current Mineral Resource estimate is provided in Table 14-3. The location of these drill holes and channel samples were presented in Figure 10-1.

Table 14-3: Description of the Turmalina Deposit Database as of September 13, 2022

Table Name	Records	Length (m)
collar	27,107 (5,098 drill holes and 22,009 channel/trench samples)	520,742
survey	27,107	406,982
assay_minesight_raw	298,972	520,742
litho	156,918	520,628
weather	200,359	520,739

This drill hole information was modified slightly to be compatible with the format requirements of the Hexagon HxGN MinePlan 3D v.15.30 (MinePlan 3D) mine planning software or the Seequent Leapfrog software and was then imported into those software packages. A number of new tables were created during the estimation process as required to capture such information as the intersection information between the drill holes and the wireframe models, density readings, capped assay records, and composited assay records.

The database included assay records (approximately 3% to 5% of the assays contained within the mineralization wireframes) which contained entries of negative values to represent intervals of no sampling, lost core, lost sample, or no core recovery, some of which are contained within the mineralized wireframes. SLR refers to these intervals of absent assay data as null values. Depending upon the specific local conditions, these null values can introduce an undesired positive bias upon the grade estimations. Jaguar therefore elected to pursue a conservative approach by inserting a very low gold value of 0.01 g/t Au for these intervals of null values.

The Turmalina deposit database also contains a large number of entries for older channel sample and drill hole information which are either clearly in error or for which the confidence of the mineralized intervals is uncertain due to conflicts with more current and accurate information. In these cases, the erroneous and uncertain drill holes and channel samples are flagged with either a “0” code denoting an unreliable drill hole or a “9” code denoting a channel sample which does not have an accurate survey location, and they are then excluded from preparation of grade estimates. A summary of the excluded sample information is presented in Table 14-4.

Table 14-4: Summary of Drill Hole and Channel Samples Excluded from Estimation, Turmalina Deposit

Sample Type	Number of Channels or Drill Holes
Channel Samples	35
FMT-series Drill Holes	71
FSN-series Drill Holes	46
FTS-series Drill Holes	498
Drill Holes, Other	1,406
Total	2,056

The SLR QP recommends that the erroneous or anomalous information be corrected for those drill holes that are located in the un-mined portions of the Turmalina deposit. Time permitting, the same corrections can be made to the mined-out portions of the Turmalina deposit to improve the quality of the data underlying any multi-year reconciliation analysis. For those drill holes and channel samples that remain, the SLR QP recommends that they be removed from the active database into a database that is dedicated specifically for records considered to be of unreliable quality.

The SLR QP is of the opinion that the drill hole and sampling database is suitable for use in preparation of Mineral Resource estimates.

14.2.2 Geological Interpretation

The interpreted 3D wireframe models of the gold mineralization have been created using the assay values from all sample types. Wireframe models of the gold distribution for the three orebodies were created using MinePlan 3D and Seequent Leapfrog Geo version 2021.1 software packages.

The wireframe limits were drawn using a cut-off grade of 0.50 g/t Au and a nominal minimum width of two metres. Some lower grade gold values were included inside the wireframes to preserve the continuity of the interpretation. The wireframe models were clipped to the original, pre-mining topography surface.

The SLR QP recommends that Jaguar slightly modify the wireframe construction strategy to use a cut-off grade that more closely reflects the Mineral Resource cut-off grade for each Orebody. The SLR QP anticipates that this will increase the average grades of the mineralized wireframes by reducing the amount of internal dilution that is currently being included.

Until 2017, the main production of the mine has been from Orebody A, which is dominated by a steeply northeast dipping tabular deposit that is located in a biotite schist host rock. Contouring activities have shown that the gold grades are oriented along a steep southeasterly plunge within this main, folded portion of the deposit. Additional, smaller mineralized zones also contribute to the production from Orebody A. These zones occur mostly as steeply dipping, tabular zones that are oriented either sub-parallel with or at a slight angle with the axis of Orebody A. In total, Orebody A is comprised of 10 separate mineralized zones. Historically, better gold grades and mineralized widths were found with increased abundances of quartz and pyrite-arsenopyrite located in the nose area of this structure, however, good gold grades can also be found as steeply plunging shoots along the limbs. The mineralization in this deposit has been outlined along a strike length of approximately 550 m and to depths of between 1,300 m to 1,400 m below surface. The deposit is accessed by a ramp system that has supported production over a vertical distance of approximately 1000 m. The mineralization in Orebody A has been defined by drilling below the lowest working level and good potential remains for discovering additional mineralization along the down-plunge projection with additional drilling. Production activities were temporarily ceased on Orebody A in December 2022.

Orebody B is situated at in the hanging wall of Orebody A at distance of approximately 50 m to 75 m, exhibiting a closer proximity in the NW portion and a more distal location in the SE portion. It comprises two parallel lenses that have been outlined along a strike length of approximately 210 m to 300 m and to depths of 950 m to 1,000 m below surface. The sequence displays a strong and penetrative foliation with a strike of 120°azimuth and a dip ranging between 75° to 80° to the northeast, exhibiting ductile structural behavior with parasitic folds and crenulation cleavage in the SE portion. The proximity to the Divinópolis Granite along strike to the southeast, which limits the eastern part of the deposit, alters the strike to 45°Az. Small millimeter-scale intercalations of quartz occur along the foliations, and centimeter to meter-scale quartz-concordant veins bordered by sulfide minerals.

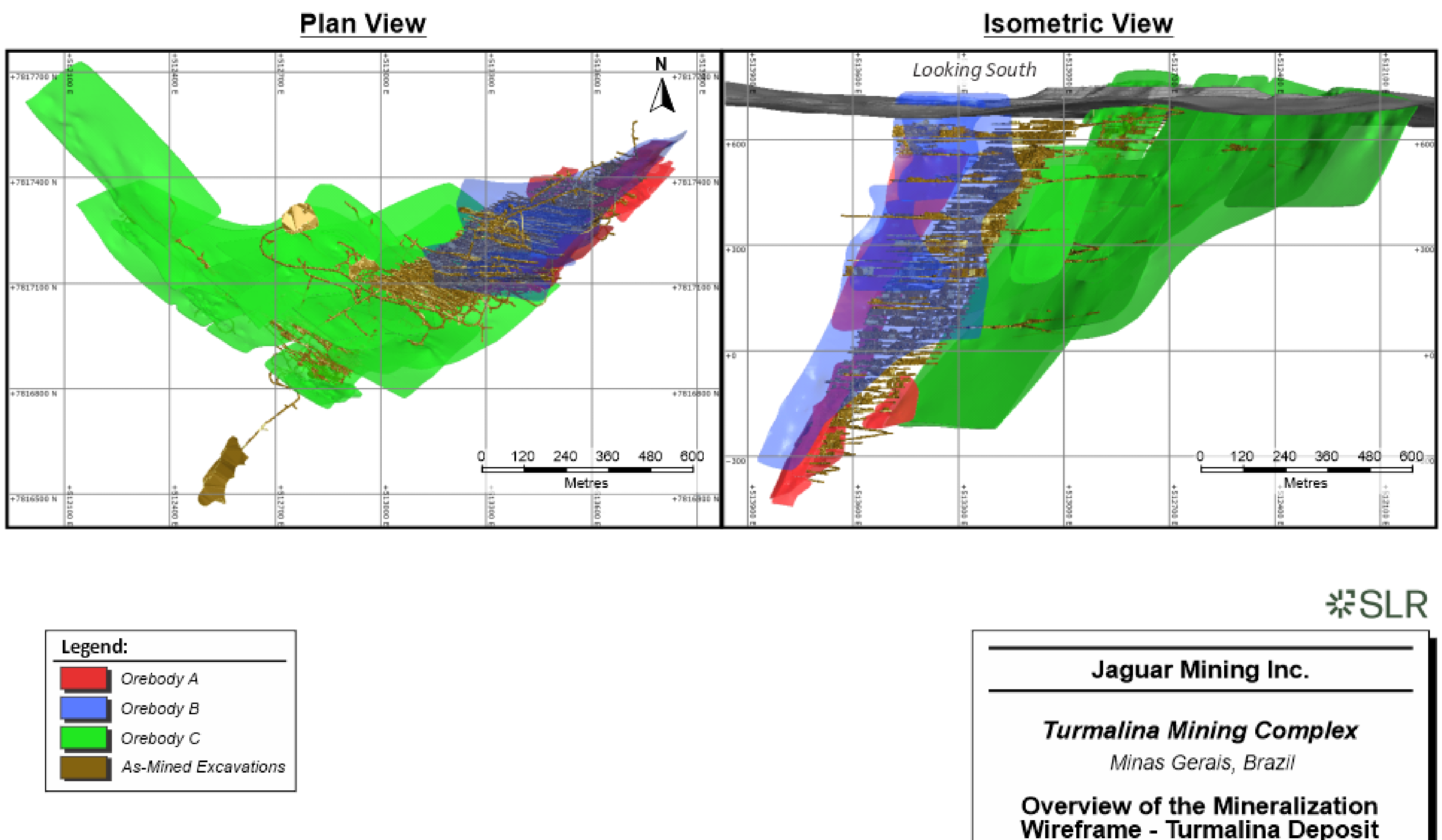
While the effective date is July 31, 2023, at the time of writing Orebody B production statistics were available up to the end of November 2023. As of November 2023, it yielded a total amount of approximately 46,000 t or 5,300 ounces of gold. The mining activities within this orebody have been conducted along a length ranging from approximately 40 to 50 meters, reaching depths between 250 and 500 meters below the surface.

As a result of the drilling campaigns carried out through to 2022, additional mineralized zones have been discovered such that Orebody C has now increased to include a series of 19 lenses that are located to the west in the structural footwall of Orebody A (Figure 14-1). Drilling activities in 2023 also have intersected a potential new lens. Drill hole FTS2165 intersected an average grade of 3.88 g/t Au along a core length of 6.7 m in a potential new lens that is being currently referred to as lens C-44. The mineralization at Orebody C occurs as a number of tabular sheets that strike in a northwesterly direction and dip steeply to the northeast. The lower portions of the Orebody C mineralization are accessed by two crosscuts from the main ramp, while access to the upper levels is via ramp access from the southwest. With the cessation of production from Orebody A in December 2022, Orebody C has become the focus of mining activities. To date, the mineralization in this deposit has been outlined along a strike length of approximately 1,000 m to 1,100 m and to a depth of between 850 m to 950 m below surface. An example cross sectional view of the mineralized wireframes for Orebody C is presented in Figure 14-2. An example of a mineralized exposure of Orebody C is presented in Figure 14-3.

The SLR QP recommends that drilling activities be continued to outline the strike and dip extents of the mineralization located within Orebodies B and C. As well, the SLR QP recommends that exploration activities should search for the presence of additional parallel structures located in proximity to Orebodies A, B, and C using a small number of horizontal drill holes drilled into the hanging wall and footwall of the known orebodies.

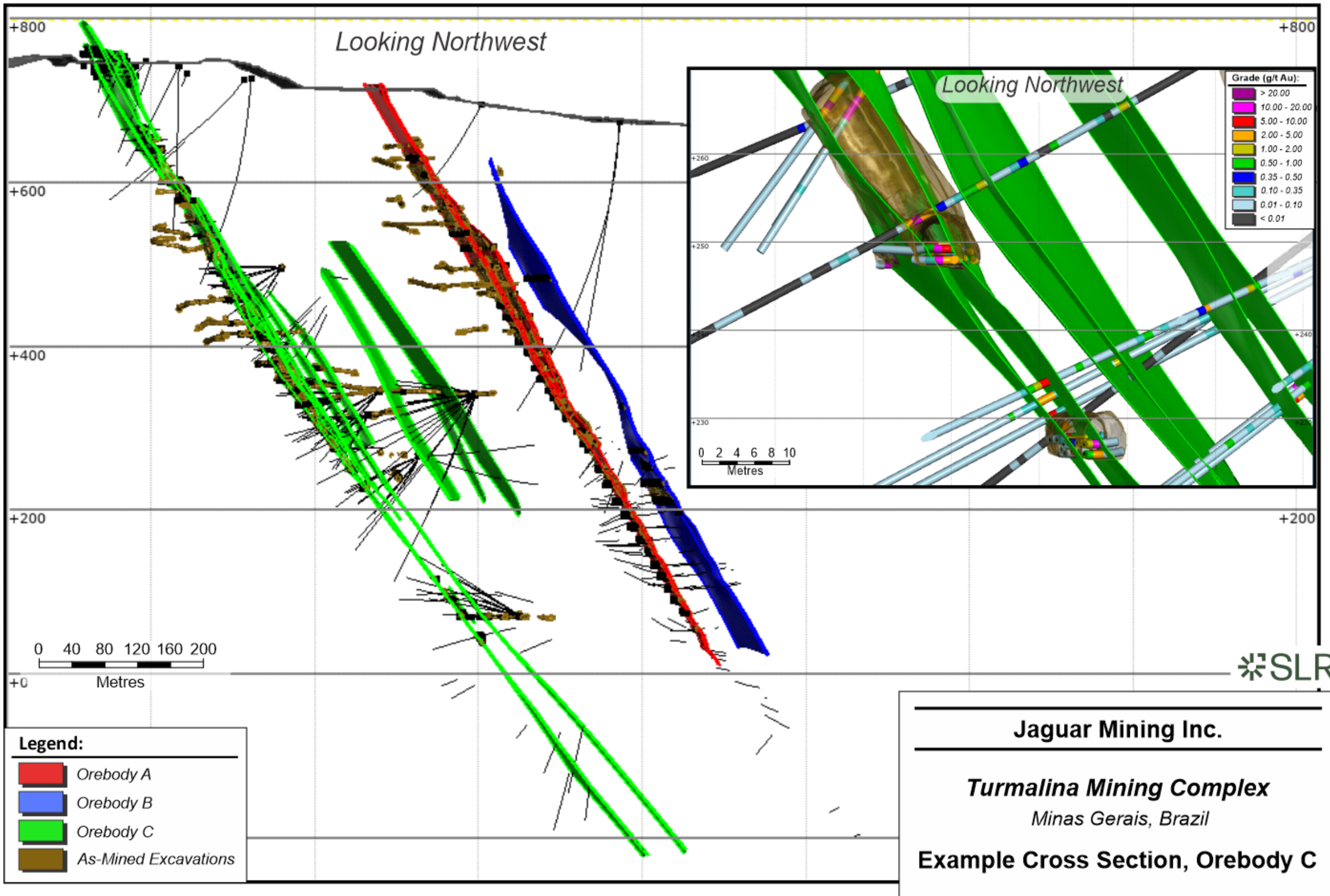
Review of the wireframes by the SLR QP reveals that the interpretations are reasonable and appropriate. The wireframes were grouped into Orebody A, B and C for statistical analysis and capping. Integer codes were assigned to each domain and coded to the block model. The coding provided the means to customize grade interpolation parameters for each domain and to ensure a hard boundary constraint on sample selection. A list of the domain codes is provided in Table 14-5.

Figure 14-1: Overview of the Mineralized Wireframes, Turmalina Deposit



Source: SLR, 2023.

Figure 14-2: Example Cross Section, Orebody C



Source: SLR, 2023.

Figure 14-3: Underground Exposure View of Orebody C Mineralization

Source: SLR, 2022.

Table 14-5: List of Wireframe Domain Codes, Turmalina Deposit

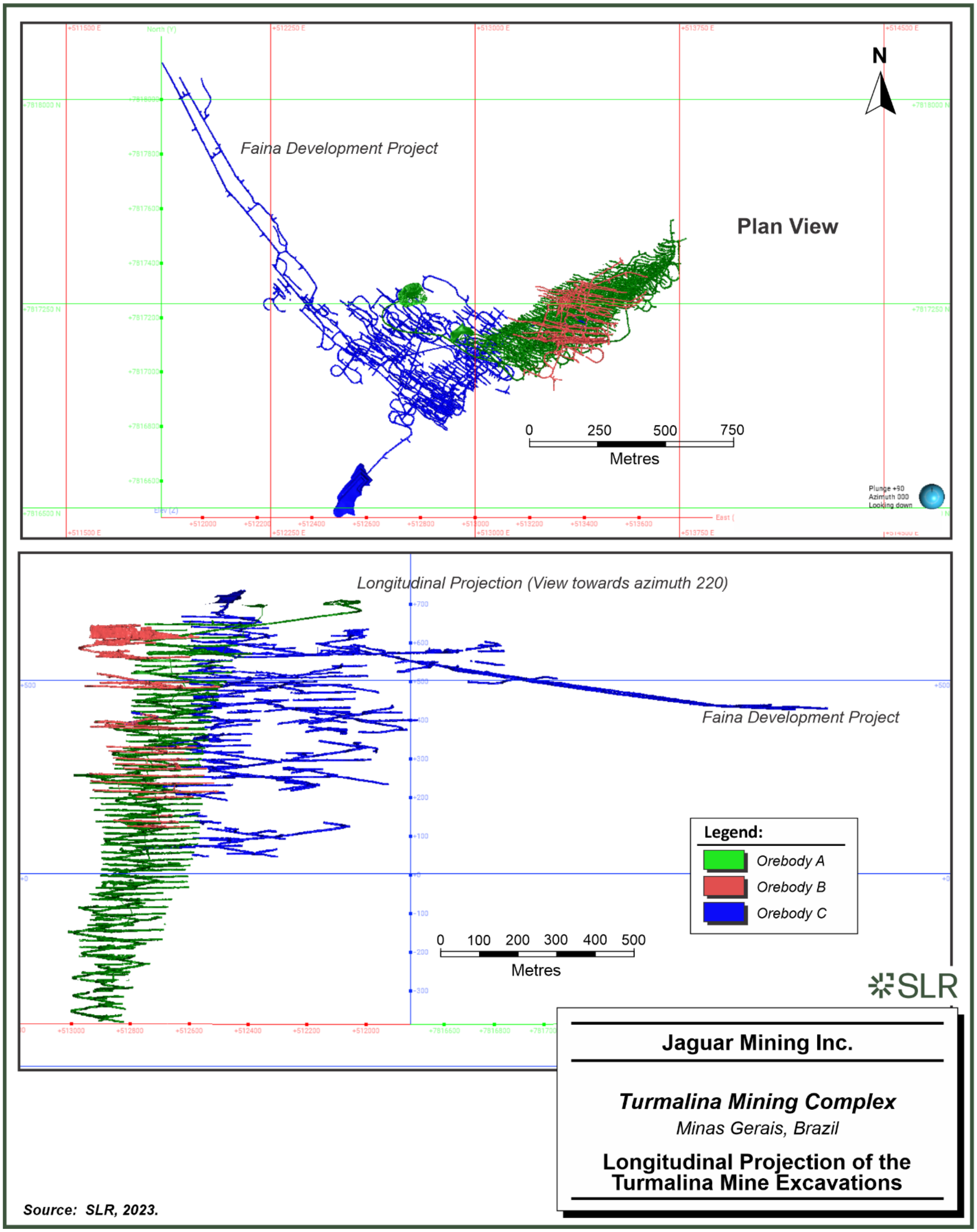
Domain Code	Name	Orebody
1	ANW	Orebody A – Portion NW
4	ASE01-L01	Orebody A – Portion SE
5	ASE01-L02	Orebody A – Portion SE
6	ASE02	Orebody A – Portion SE
7	ASE03	Orebody A – Portion SE
8	AGRANADA	Orebody A – Portion SE – associated with Garnets
9	MVU	Orebody A Ultramafic Hosted Zone
10	AXS-FW	Orebody A
11	AXS-HW	Orebody A
12	ANW-L01	Orebody A
15	B	Orebody B

Domain Code	Name	Orebody
16	BHW	Orebody B Hang wall
17	BFW	Orebody B Footwall
20-30	CSE	Orebody C – Portion SE
31, 32, 34, 35, 36	CCE	Orebody C – Center Portion – CE “Central”
42-44	CNW	Orebody C – Portion NW

14.2.3 Topography and Excavation Models

A topographic surface of the immediate mine area that is current as of October 2013 was used to code the block model for those portions of Orebodies A, B, and C that have been excavated by means of open pit mining methods. Wireframe models of the underground workings as of July 31, 2023, were prepared and used to code the block model (Figure 14-4).

Figure 14-4: Longitudinal Projection of the Turmalina Mine Excavations



Source: SLR, 2023.

14.2.4 Sample Statistics and Grade Capping

The mineralization wireframe models were used to code the drill hole database and identify the resource related samples. These samples were extracted from the database into their respective domains, and then subjected to statistical analyses by means of histograms, probability plots, and decile analyses. A combined total of 98,320 samples were contained within the mineralized wireframes. The sample statistics are summarized in Table 14-6.

Based on their review of the assay statistics, the SLR QP is of the opinion that a capping value of 50 g/t Au remains appropriate for each of the three orebodies, which is unchanged from the recommended capping values presented in RPA (2017). This capping value has been applied to all gold assays prior to compositing.

The SLR QP recommends that possible revised capping values for Orebody C in the 30 g/t Au to 45 g/t Au range be analyzed to determine whether application of a revised capping value will improve grade reconciliation with production data.

Table 14-6: Descriptive Statistics of the Raw and Capped Gold Assays

Item	Orebody A		Orebody B		Orebody C	
	Uncapped	Capped (50 g/t Au)	Uncapped	Capped (50 g/t Au)	Uncapped	Capped (50 g/t Au)
Count	43,681	43,681	8,744	8,744	38,513	38,513
Length-Weighted Average (g/t Au)	5.86	5.77	2.71	2.69	2.77	2.75
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.00	0.00
Maximum (g/t Au)	315.00	50.00	76.83	50.00	184.00	50.00
SD (g/t Au)	9.77	9.06	5.16	5.01	5.45	5.07
Coefficient of Variation	1.67	1.57	1.91	1.86	2.04	1.92

14.2.5 Compositing

The selection of an appropriate composite length began with examination of the descriptive statistics of the raw assay samples and preparation of sample length frequency histograms. Consideration was also given to the size of the blocks in the model. The SLR QP is of the opinion that a composite length of one metre for all samples is reasonable. This composite length remains unchanged from that described in RPA (2017). All samples contained within the mineralized wireframes were composited to a nominal one metre length using the best-fit function of the MinePlan 3D software package. The composite descriptive statistics are provided in Table 14-7.

Table 14-7: Descriptive Statistics of the Gold Composites, Turmalina Deposit

Item	Orebody A		Orebody B		Orebody C	
	Capped	Capped (Declustered)	Capped	Capped (Declustered)	Capped	Capped (Declustered)
Count	44,488	44,488	8,753	8,753	35,147	35,147
Length-Weighted Average (g/t Au)	5.82	4.61	2.66	2.12	2.76	1.81

Item	Orebody A		Orebody B		Orebody C	
	Capped	Capped (Declustered)	Capped	Capped (Declustered)	Capped	Capped (Declustered)
Minimum (g/t Au)	0.01	-	0.01	-	0.01	-
Maximum (g/t Au)	50.00	-	50.00	-	50.00	-
SD (g/t Au)	8.42	9.93	4.61	7.27	4.95	7.65
Coefficient of Variation	1.45	2.15	1.73	3.43	1.79	4.22

14.2.6 Bulk Density

Jaguar continued its program of systematic determination of the bulk densities of the various mineralized zones through 2022 using samples of ore and waste collected from drill holes. The bulk density values were determined by the water displacement method on selected pieces of drill core by Jaguar's laboratory staff at the Caeté site. In 2022, a total of 1,108 ore and waste bulk density samples have been collected at Turmalina (Table 14-8). The average bulk density for the mineralized material in both orebodies remains essentially unchanged from that presented in RPA (2017). The average density values for these mineralized wireframes were coded into the block model.

The distribution of density measurements from the mineralized wireframes for Orebody C suggests that, while for the most part the density values are consistent with a silicate host rock, the presence of a weakly developed shoulder in the range of 3.1 t/m^3 to 3.4 t/m^3 suggests the presence of a second lithological unit of higher density. This could be due to the presence of an iron formation unit within the mineralized wireframes.

The SLR QP recommends that Jaguar prepare and code a lithological model for the Turmalina mine into the block model to improve the allocation of the density measurements for future Mineral Resource updates.

The SLR QP recommends that additional density measurements be collected from samples contained within the mineralized wireframes of Orebody B.

Table 14-8: Summary of Density Measurements by Orebody, Turmalina Deposit

Orebody	Year End 2020		2022 Samples	
	Bulk Density (g/cm^3)	No. of Data Entries	Bulk Density (g/cm^3)	No. of Data Entries
A	2.83	368	2.83	180
B			2.83	3
C	2.91	430	2.90	147

14.2.7 Trend Analysis

14.2.7.1 Grade Contouring

As an aid in carrying out variography studies of the distribution and continuity of the gold grades in the mineralized domain models, a short study to examine the overall trends was carried out for selected mineralized lenses forming Orebody C. For this exercise, the composite gold values for the lens were contoured and reviewed longitudinally for high-grade oreshoots. The results from grade contouring with the most up-to-date drilling are consistent with those previously presented in RPA (2019).

Although less well defined than at Orebody A, narrow, steep plunging, high grade ore shoots are also found in the lenses of Orebody C and additional tight spaced sampling is required to further define them.

The SLR QP recommends that geological mapping, along with structural and alteration studies, be continued to understand the nature of the gold mineralization and the structural and stratigraphic controls on the distribution of the gold values for Orebody C. The results of these studies will be of great use in understanding the controls on the distribution of the higher grade pods and will aid in developing exploration targets in this area of the mine property.

14.2.7.2 Variography

Figure 14-5 shows the analysis, completed in 2019, of the spatial continuity of the gold grades that remain effectively unchanged from the conclusions presented in RPA (2015). A summary of the variogram parameters derived for each of the three orebodies is presented in Table 14-9. The spatial continuity of the gold grades in Orebodies A, B, and C is currently being re-examined in light of Jaguar's increasing understanding of the distribution of the gold grades for these three orebodies.

Figure 14-5: Major Axis and Semi-Major Axis Variograms, Orebody C

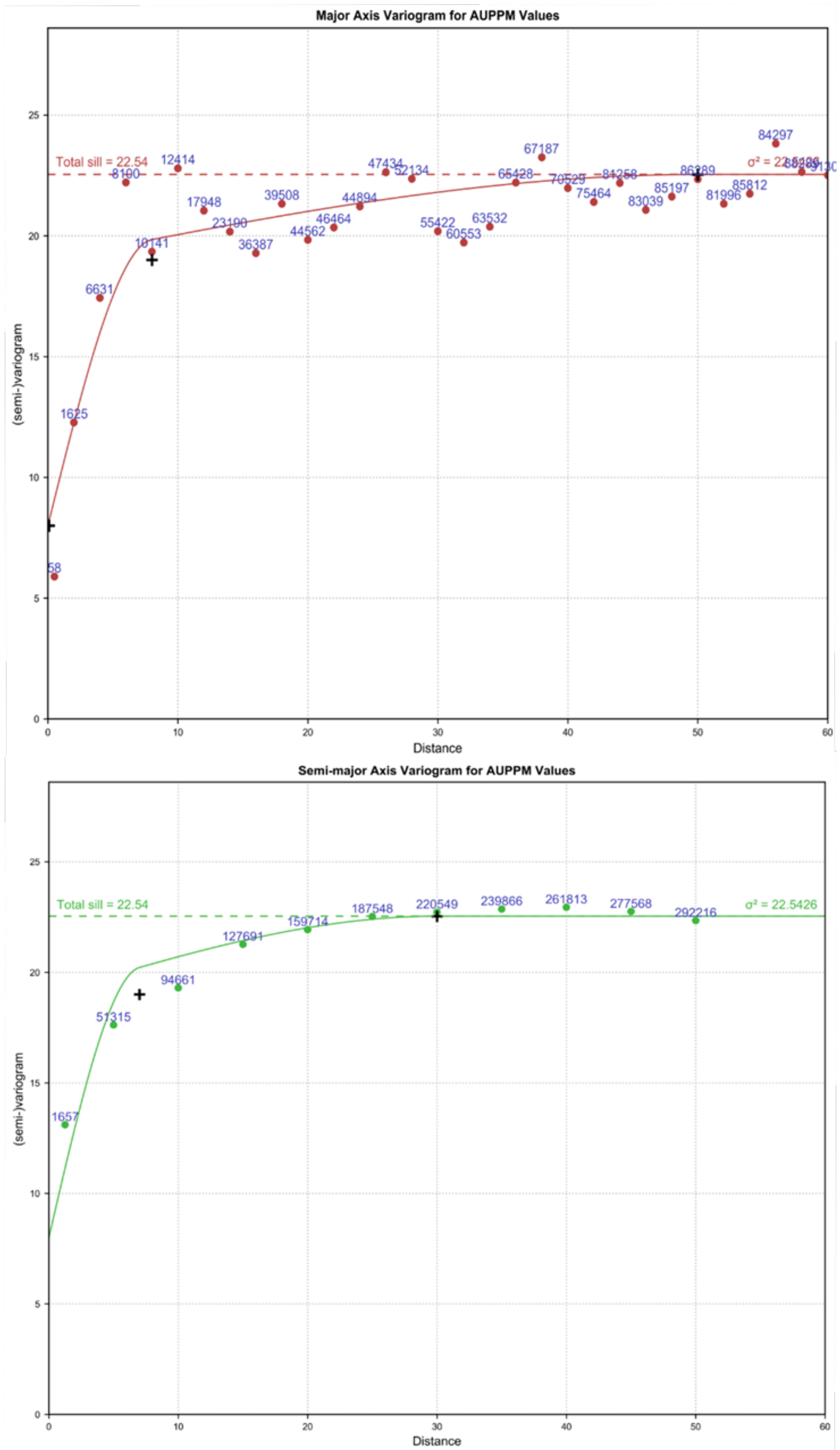


Table 14-9: Summary of Variography Parameters, Turmalina Deposit

Item	Orebody A			Orebody B	Orebody C		
	Group 1		Group 3		Group 1	Group 2	Group 3
Rock Code	1 ,4 ,5 ,6, 8, 9 ,12		7,10,11	15,16	21, 22, 23, 24, 25, 26, 27, 31, 32, 33, 34, 41, 42, 43	28	29
Nugget (C0)				5		8	
Sill Major Axis (C1)				8.4		11	
Sill Major Axis (C2)				5.8		3.54	
Model Type				Spheroidal		Spheroidal	
Orientation (Az/Dip/Plunge)	050/-55/47		058/-55/40	030/-65/40	060/-55/35	037/-58/40	051/-53/10
Anisotropy Ratio (Major/Semi-Major)				3.3		1.7	
Anisotropy Ratio (Major/Minor)				5.0		5.0	
Distances							
Structure1 Major (m)				27		8	
Structure1 Semi-Major (m)				4		7	
Structure1 Minor (m)				3		5	
Structure2 Major (m)				50		50	
Structure2 Semi-Major (m)				15		30	
Structure2 Minor (m)				10		10	

14.2.8 Block Model Construction

The block model construction strategy was modified from what was previously employed at Turmalina. The block model was constructed using the MineSight 3D software package and comprised an array of 4 m x 4 m x 4 m sized parent blocks, sub-blocked to a minimum block size of 1 m x 1 m x 1 m. The model is oriented parallel to the coordinate grid system (i.e., no rotation or tilt). The block sizes for this model were selected to minimize the variation when compared with the block model strategy previously employed at Turmalina. The block model origin, dimensions, and attribute list are provided in Table 14-10.

Attributes were created to store information such as rock code, material densities, estimated gold grades, mineral resource classification, and mined out material (Table 14-11).

Table 14-10: Block Model Definition, Turmalina Deposit

Type	Northing (Y)	Easting (X)	Elevation (Z)
Minimum Coordinates (m)	7,816,600	511,800	-900
Maximum Coordinates (m)	7,818,100	514,200	800
User Block Size (m)	4	4	4
Min. Block Size (m)	1	1	1
Rotation (°)	0.000	0.000	0.000

Table 14-11: List of Block Model Attributes, Turmalina Deposit

Variable Name	Description
auokc	Gold by Ordinary Kriging
avd	Average Distance of Informing Samples
class	Pass Number, OK (1=Half of Variogram Range, 2=Variogram Range, 3=2x Range, 4=4x Range)
clod	Distance to Closest Informing Sample
dens	Material Density
ndh	Number of Drill Holes for Estimation
nq	Number of Quadrants with Information
nsmp	Number of Informing Samples
fthd	Distance to Farthest Informing Sample
rclass	Mineral Resource Classification (1=measured, 2=indicated, 3=inferred)
rock	Material Code
topo%	Percent of Block Below Topography Surface
var	Variance

14.2.9 Grade Estimation

Gold grades were estimated into the blocks by means of inverse distance cubed (ID3) and the Ordinary Kriging (OK) interpolation algorithms. A total of four interpolation passes at different ranges were carried out using distances derived from the variography results and the search ellipse parameters presented above. The orientations of the search ellipses were varied for Orebodies A and C so as to provide a better alignment with the spatial orientations of the individual mineralized wireframes. In total, three different search ellipse orientations (Groups 1 to 3) were used to estimate the gold grades for Orebody A. Three different search ellipse orientations were also used to estimate the gold grades for Orebody C.

The SLR QP recommends that the Jaguar team consider the use of a dynamic anisotropy method for estimation of gold grades into the Turmalina mine block model.

The SLR QP also recommends that Jaguar review the anisotropy ratios on an individual wireframe basis for the Turmalina mine rather than on an orebody basis.

In general, “hard” domain boundaries were used along the contacts of the mineralized domain models for all of the mineralized lenses. Only data contained within the respective wireframe model were allowed to be used to estimate the grades of the blocks within the wireframe in question, and only those blocks within the wireframe limits were allowed to receive grade estimates. The block grades were estimated in four estimation passes using the parameters presented in Table 14-12.

Due to the unique geometry of Orebody A, three sub-domains were created for the main mineralized lens. Domain ANW was created for the “hinge” portion of the mineralized wireframe, and separate domains were created for the northern and southern “limbs” of the mineralization (ASE II and ASE, respectively). Soft boundaries were used for the composite data in these three sub-domains when interpolating the gold grades to permit a smooth transition of grades between the three sub-domains.

Table 14-12: Summary of the Grade Estimation Strategy, Turmalina Deposit

Parameters	Orebody	Pass 1	Pass 2	Pass 3	Pass 4
Minimum No. of Composites	A, B, C	3	2	1	1
Maximum No. of Composites	A, B, C	16	16	16	16
Maximum No. Composites per Drill Hole	A, B, C	2	2	4	8
Maximum No. Composites per Quadrant	A, B, C	2	2	4	8
Minimum No. Quadrant with Composites	A, B, C	2	2	1	1
Major Ellipse Dimension (m)	A	15	30	60	120
	B	25	50	100	200
	C	25	50	100	200
Semi-Major Ellipse Dimension (m)	A	10	20	40	80
	B	10	15	30	60
	C	15	30	60	120
Minor Ellipse Dimension (m)	A	3	6	12	24
	B	5	10	20	40
	C	5	10	20	40

14.2.10 Block Model Validation

14.2.10.1 Global Estimate

Validation of the estimated block model grades included a comparison of the average of all estimated block grades to the average of the composites (Table 14-13). In consideration of such items as the volume-variance effect, projection of estimated grades beyond the limits of the drill hole information and the effect of clustered data, the average estimated block grades agree reasonably well with the average grades of the informing composites.

Table 14-13: Assays vs Composite vs Block Model Grades Orebody A, Turmalina Deposit

Item	Raw Assays (g/t Au)		Composites (g/t Au)		Block Grades (g/t Au)	
Statistics	Uncapped	Capped	Capped	Capped (Declustered)	Nearest Neighbour (NN)	Ordinary Kriging (OK)
Count	43,681	43,681	44,488	44,488	2,719,604	2,719,604
Average (g/t Au)	5.86	5.77	5.82	4.61	4.32	4.44
Minimum (g/t Au)	0.01	0.01	0.01	-	0.01	0.01
Maximum (g/t Au)	315.00	50.00	50.00	-	50.00	42.00
Standard Deviation (g/t Au)	9.77	9.06	8.42	9.93	7.39	4.93
CV	1.67	1.57	1.45	2.15	1.71	1.11

Table 14-14: Assays vs Composite vs Block Model Grades Orebody B, Turmalina Deposit

Item	Raw Assays (g/t Au)		Composites (g/t Au)		Block Grades (g/t Au)	
Statistics	Uncapped	Capped	Capped	Capped (Declustered)	Nearest Neighbour (NN)	Ordinary Kriging (OK)
Count	8,744	8,744	8,753	8,753	1,345,338	1,345,338
Average (g/t Au)	2.71	2.69	2.66	2.12	1.92	1.90
Minimum (g/t Au)	0.01	0.01	0.01	-	0.01	0.01
Maximum (g/t Au)	76.83	50.00	50.00	-	50.00	36.50
Standard Deviation (g/t Au)	5.16	5.01	4.61	7.27	4.24	2.28
CV	1.91	1.86	1.73	3.43	2.21	1.20

Table 14-15: Assays vs Composite vs Block Model Grades Orebody C, Turmalina Deposit

Item	Raw Assays (g/t Au)		Composites (g/t Au)		Block Grades (g/t Au)	
Statistics	Uncapped	Capped	Capped	Capped (Declustered)	Nearest Neighbour (NN)	Ordinary Kriging (OK)
Count	32,942	32,942	35,147	35,147	7,532,181	7,532,181
Average (g/t Au)	2.79	2.76	2.76	1.81	1.45	1.49
Minimum (g/t Au)	0.01	0.01	0.01	-	0.01	0.01
Maximum (g/t Au)	184.00	50.00	50.00	-	50.00	29.83
Standard Deviation (g/t Au)	5.69	5.31	4.95	7.65	3.25	2.00
CV	2.04	1.92	1.79	4.22	2.24	1.34

14.2.10.2 Local Estimate

A series of swath plots were prepared in which the average grade of the channel and drill hole composites and the block grades were compared by elevation (Figure 14-6, Figure 14-7, and Figure 14-8). For the swath plots, OK block grades are shown in orange, and the Nearest Neighbour (NN) block grades are shown in blue.

There is typically a strong agreement between the estimated OK block grades and the NN block grades, with variability increasing as data density and block volumes decrease.

Figure 14-6: Swath Plot by Elevation, Orebody A, Turmalina Deposit (40 m bin width)

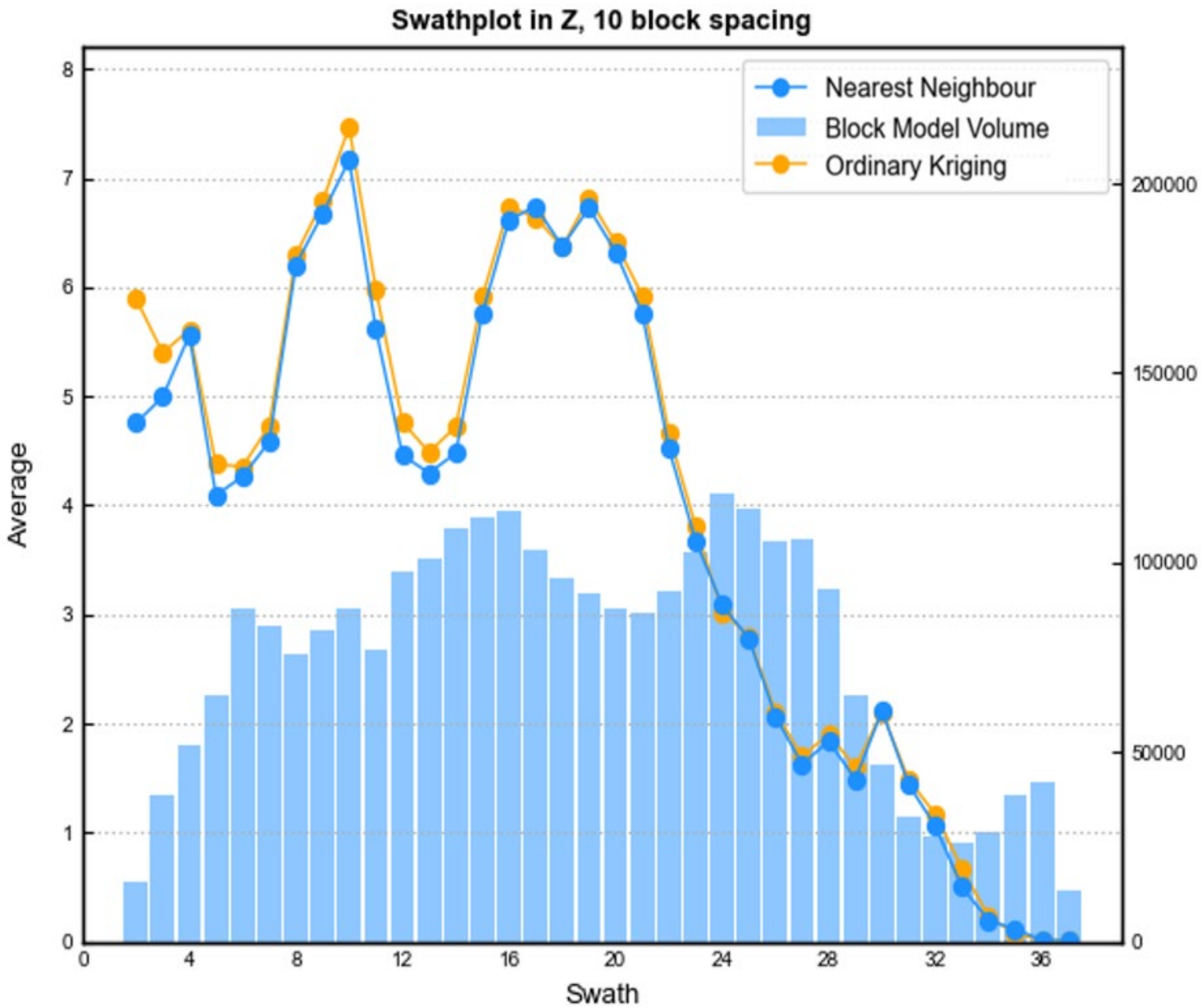


Figure 14-7: Swath Plot by Elevation, Orebody B, Turmalina Deposit (40 m bin width)

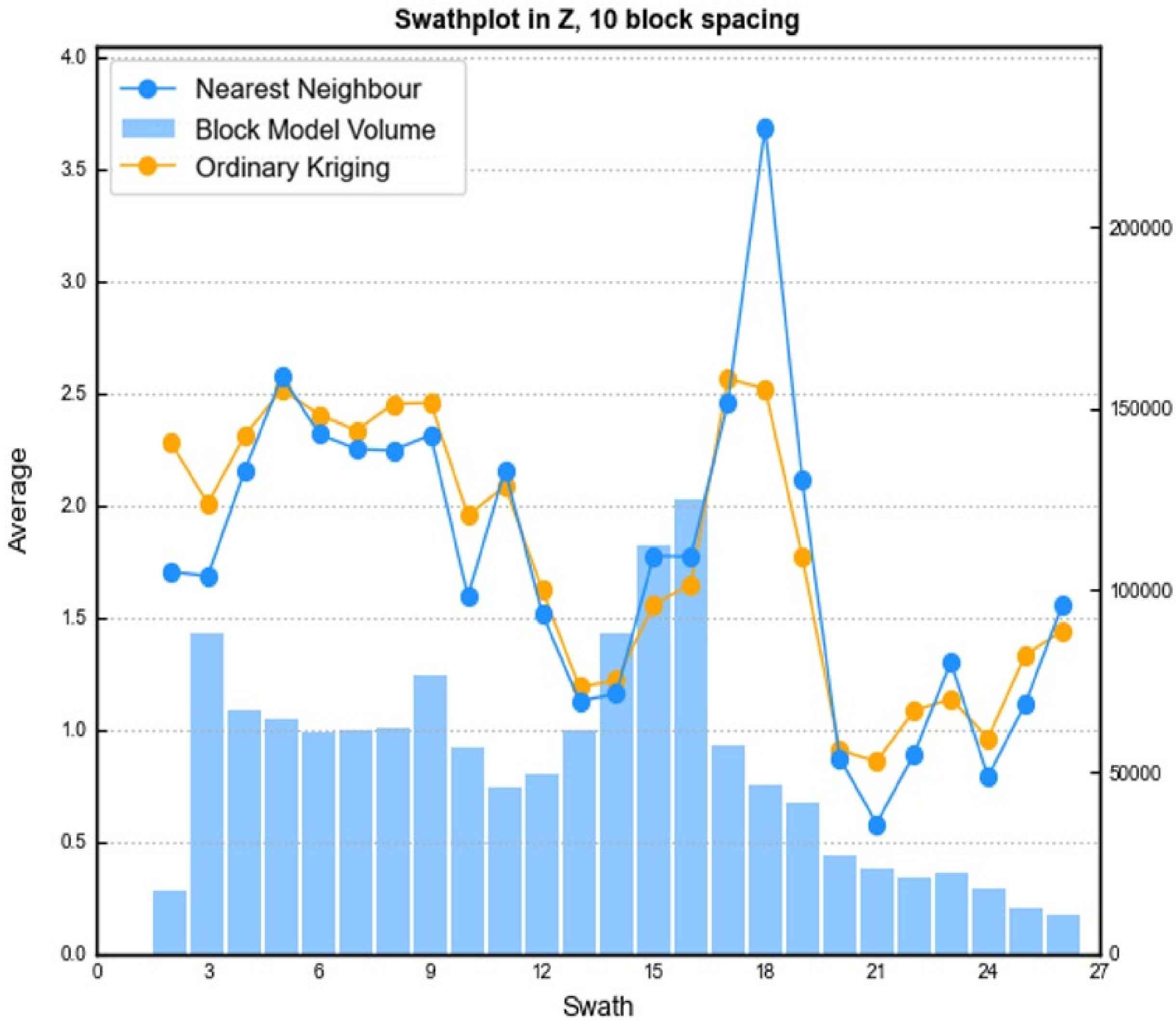
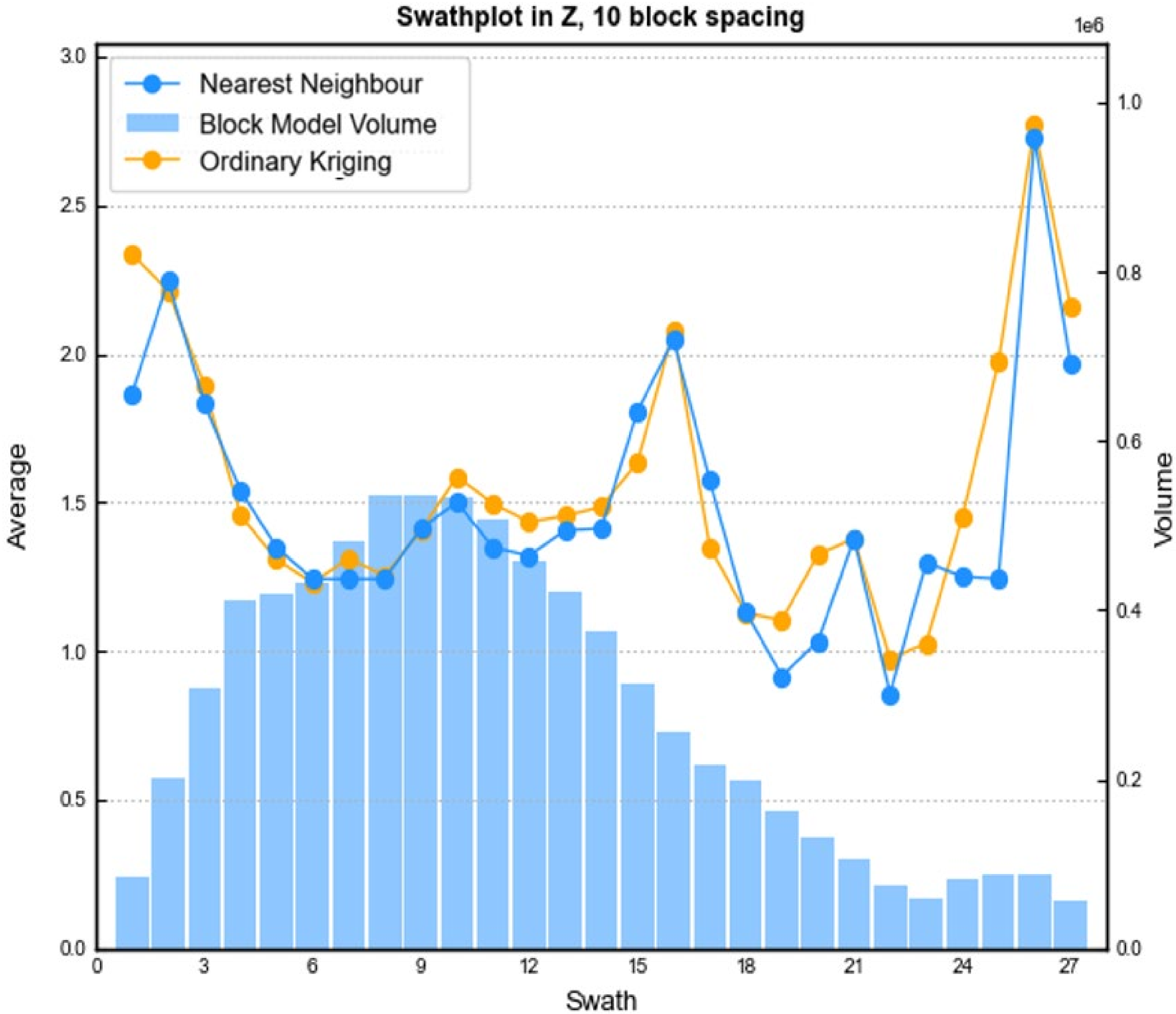


Figure 14-8: Swath Plot by Elevation, Orebody C, Turmalina Deposit (40 m bin width)



Evaluation of the accuracy of the local estimate was also carried out by visually comparing the contoured gold grades against the estimated block grades in longitudinal views.

The SLR QP recommends that a short study be carried out to determine the optimum selection of search strategy input parameters to reduce the number of estimation artifacts for these mineralized lenses. The study should begin with the examination of the relative spacing of the informing samples and the resulting impacts that spacing has on the number of informing samples per quadrant and on the resulting estimate. This study could also help reduce the variances observed in the swath plots by reducing the degree of smoothing in both the lower (<0.50 g/t Au) and upper portions (> 10 g/t Au) of the grade distribution.

The SLR QP also recommends that additional drill hole information be collected in areas with economic grades but low density sample to improve the confidence level of the Mineral Resource estimate, to reduce and remove the estimation artifacts, and to better define the down-dip projections of the mineralization.

14.2.10.3Reconciliation to Production

Validation exercises also consisted of comparing the revised block model estimated grades and tonnes against the 2022 and January 1 to September 30, 2023 mine and plant production data on a quarterly basis (Table 14-16, Figure 14-9). In brief, the broken muck from the development headings and stopes is brought to surface and transported by truck to the stockpile area at the Turmalina Plant. Samples are collected for each truck load to determine the grade of the material that was excavated from the mine. From the stockpile area, the broken muck is then fed into the Turmalina Plant.

The Turmalina Plant tonnages are derived from weightometer measurements on the feed belt and the plant feed grades are determined from direct sampling of material in the Turmalina Plant prior to the leaching circuit. The mine tonnages are derived from truck counts and the mine grade information is derived from stockpile samples. The trucks are tallied daily. Considering that the updated block model incorporated all drill hole and channel sample information up to October 31, 2023, this comparison is closer to an F2 (Mine-to-Plant) reconciliation as described in Parker (2014) because the resource model has data support equivalent to a grade control model.

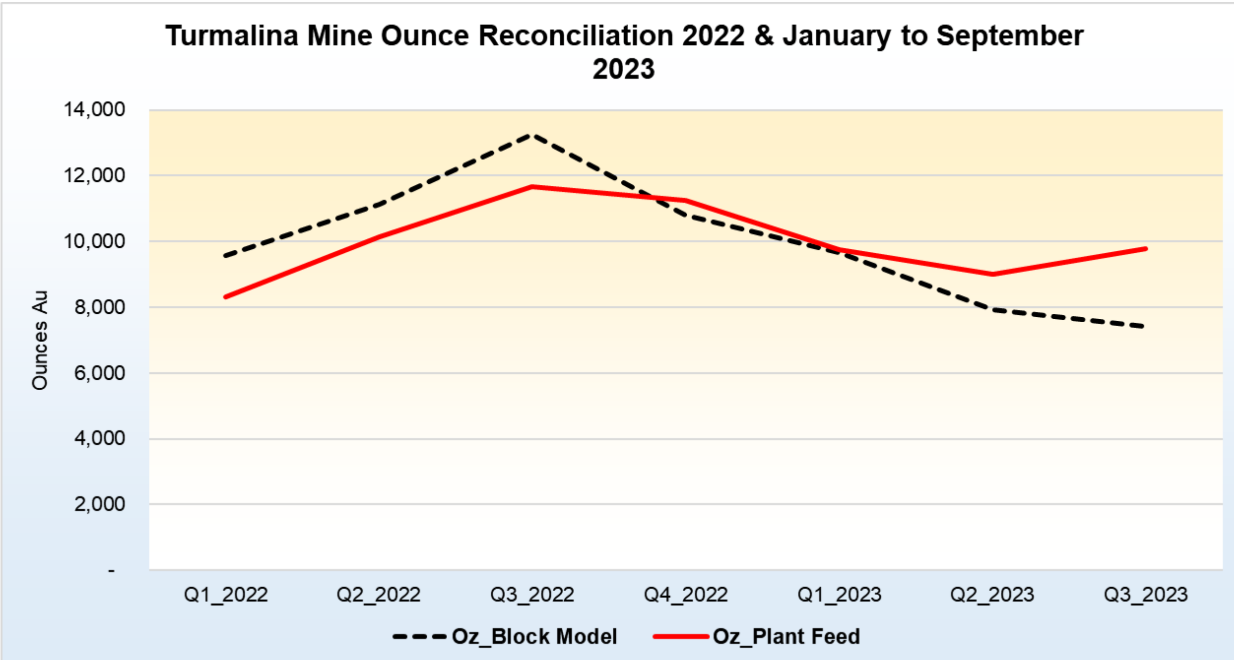
The monthly tonnage and grade figures derived from the 2023 block model utilized the as-mined excavation solids models for the development and stopes completed in 2022 and January to October 2023 to constrain the reports. The mined out volumes were created using data collected using a Cavity Monitoring Survey (CMS) and/or Total Station survey equipment. In a small number of cases, the shape and size of the excavated volumes could not be surveyed due to equipment failures, timing, or safety issues. This is likely the main reason why the model tonnes are less than the mined tonnages in Table 14-16.

The SLR QP recommends that when no CMS model is available for a given excavation volume, the design shape for the excavations in question be used as a proxy when preparing the reconciliation reports.

Table 14-16: Quarterly Production, 2022 and January to September 30, 2023, Turmalina Deposit

Period	Block Model			Plant Feed		
	Tonnage (t)	Grade (g/t Au)	Contained (oz Au)	Tonnage (t)	Grade (g/t Au)	Contained (oz Au)
Q1 _2022	84,370	3.52	9,562	85,853	3.02	8,327
Q2_2022	110,650	3.13	11,120	100,573	3.13	10,128
Q3_2022	114,271	3.61	13,266	105,122	3.45	11,241
Q4_2022	107,594	3.12	10,798	100,806	3.47	11,241
Total, 2022	**416,884**	**3.34**	**44,746**	**392,354**	**3.28**	**41,367**
Q1_2023	110,646	2.71	9,652	108,323	2.80	9,749
Q2_2023	106,287	2.32	7,935	100,074	2.80	9,007
Q3_2023	110,495	2.09	7,415	100,689	3.02	9,786
Total, 2023*	**327,427**	**2.37**	**25,002**	**309,085**	**2.87**	**28,542**
Grand Total	**744,311**	**2.91**	**69,747**	**701,438**	**3.10**	**69,909**

Figure 14-9: 2022 and January to September 2023 Reconciliation Information by Quarter, Contained Ounces, Turmalina Deposit

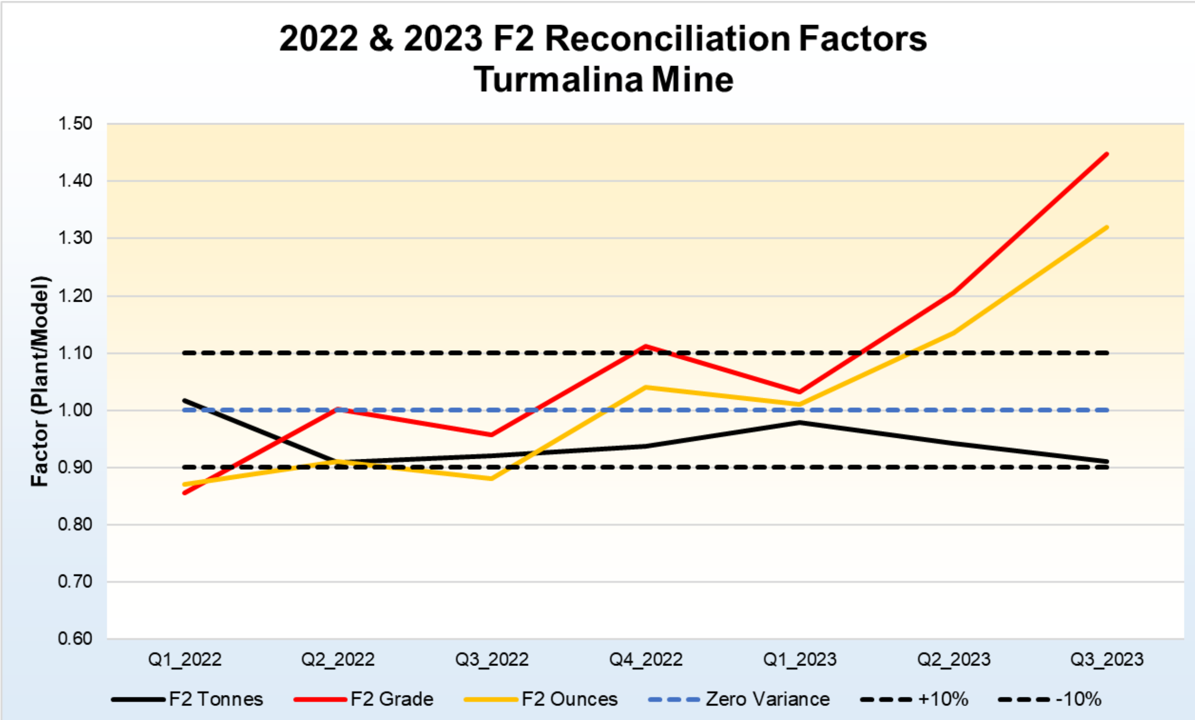


The grade of all blocks that are located outside of the mineralized wireframe models (ostensibly the waste materials) has been set to a value of zero for the 2023 block model. This approach will then result in the inclusion of all waste tonnes (both planned and unplanned dilution) along with the recovered ore tonnes. The data then represent the fully diluted, recovered tonnes and grade as predicted from the block model and so will be appropriate for comparison with plant feed grade. The quarterly F2 reconciliation results are presented in Figure 14-10.

In general terms, the SLR QP observes that there is good agreement between the Turmalina Plant data and the block model for the 2022 and January to September 2023 period. The SLR QP is of the opinion that this agreement suggests that the sampling strategies, assaying methods, and estimation procedures currently used at the mine to prepare the grade block models are producing reasonable predictions of the tonnages, grades, and contained metal being received at the Turmalina Plant.

The reconciliation information presented above utilizes the grade block model that was prepared using the drill hole and channel sample information that was available as of September 30, 2023. The estimated grades are then compared to the production information for the previous periods, thus allowing an analysis of the effectiveness of the sampling, assaying, and estimation protocols.

Figure 14-10: Quarterly F2 Reconciliation Factors, Model to Plant, Turmalina Deposit



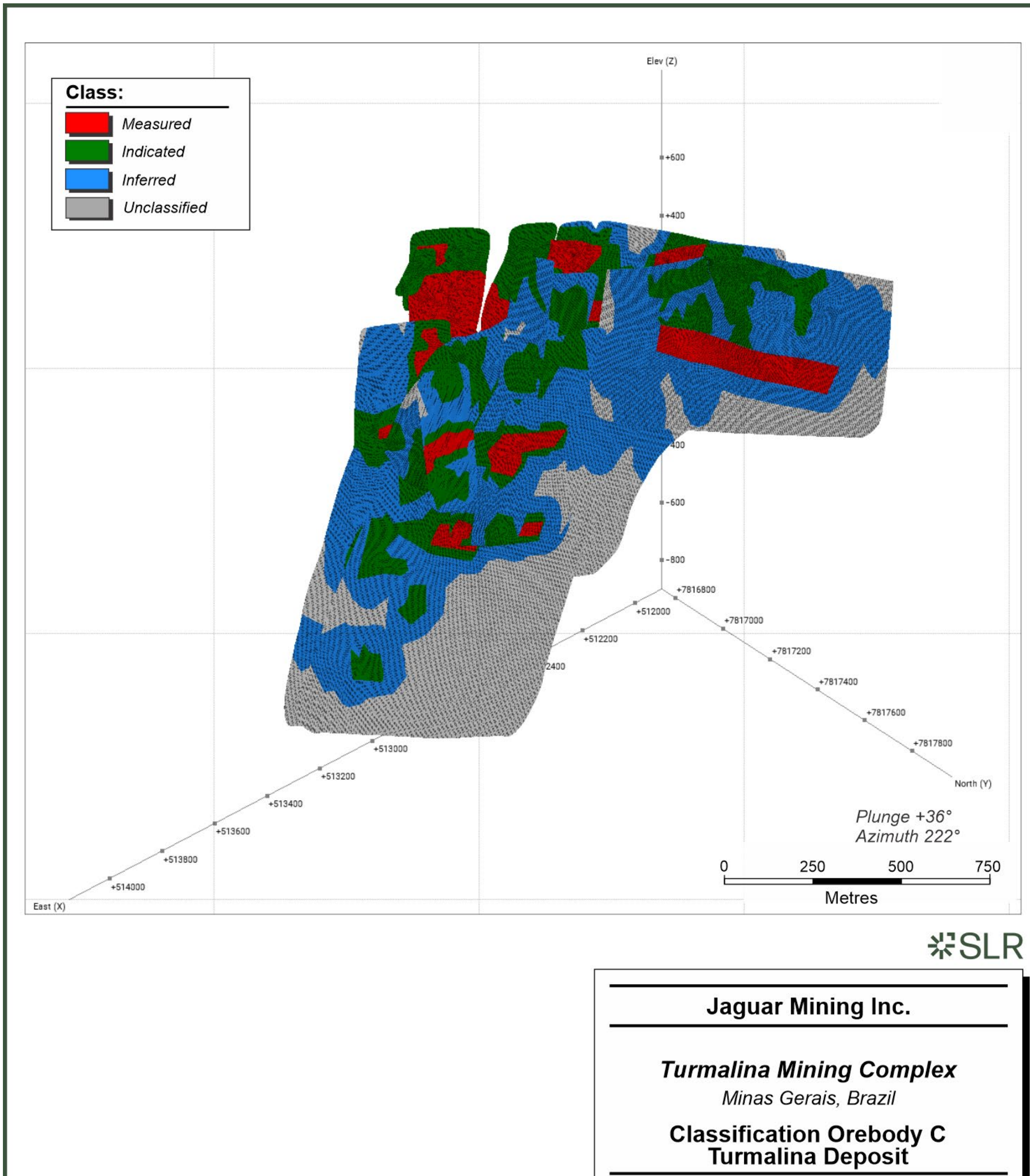
14.2.11 Mineral Resource Classification Criteria

The Mineral Resources in this Technical Report were estimated in accordance with the definitions contained in CIM (2014).

The mineralized material for each wireframe was classified into the Measured, Indicated, or Inferred Mineral Resource category based on the search ellipse ranges obtained from the variography study, the continuity of the gold mineralization, the density of samples, and the presence of underground access.

On the basis of these criteria, Measured Mineral Resources comprise material that has been estimated using Pass #1 and that is located between developed levels. Indicated Mineral Resources comprises material that has been estimated using Pass #2, and Inferred Mineral Resources comprise material that has been estimated using Pass #3. Clipping polygons were used to smooth the final classification and ensure continuity and consistency of the classified blocks. An example of the final classification for Orebody C is presented in Figure 14-14.

Figure 14-11: Classification Orebody C, Turmalina Deposit



Source: SLR, 2023.

14.2.12 Cut-off Grade Parameters

A cut-off grade of 1.79 g/t Au is used for reporting of the current Mineral Resources at the Turmalina deposit. This compares with a cut-off grade of 1.49 g/t Au that was used to prepare the December 31, 2021 Mineral Resource statement. The current cut-off grade was calculated using a gold price of US$1,800/oz, an exchange rate of BRL5.20:US$1.00, average gold recovery of 85.8%, and forecast 2023 operating costs for mining, processing, general and administration, taxes, and refining of BRL439.13/t (US$84.45/t). Gold prices are based on consensus, long term forecasts from banks, financial institutions, and other sources.

Only those Mineral Resources that displayed spatial continuity were reported within a potentially mineable shape created in Deswik software. Constraining volumes (potentially mineable shapes) for the reporting of Mineral Resources were created using data from the current operations.

The parameters used in Deswik Stope Optimizer are:

- • 20 m high by 5 m on strike
- • Thickness is variable with a minimum width of 2.0 m
- • Shapes were created using the resource cut-off grade
- • Minimum dip of 45°

The SLR QP recommends that Deswik parameters be adjusted to better align to the local strike and dip variations of the resource wireframe reporting panels. This would allow the inclusion of additional material to the Mineral Resource.

14.2.13 Mineral Resource Estimate

The Mineral Resources are inclusive of Mineral Reserves. The Mineral Reserve reporting panels include some areas of internal dilution that were excluded from the Mineral Resource reporting panels. This material has been added to the Mineral Resource and accounts for less than 5% of the total Mineral Resource. The final Mineral Resource classification was applied to material within mineable stope panels, on a majority basis.

The Mineral Resources are presented in Table 14-17. It is important to note that the Mineral Resources include remnant material for those areas in the upper portions of the mine where potentially economic grade material has been left behind. These areas were scrutinized and evaluated for their potential of being recoverable prior to being categorized as Mineral Resources.

Table 14-17: Summary of Mineral Resources as of July 31, 2023, Turmalina Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Orebody A			
Measured	717	6.28	145
Indicated	263	3.64	31
Sub-total M+I	***980***	***5.59***	***176***
Inferred	95	3.61	11
Orebody B			
Measured	297	3.69	35

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated	193	3.88	24
Sub-total M+I	***490***	***3.75***	***59***
Inferred			
Orebody C			
Measured	677	3.53	77
Indicated	1,232	3.36	133
Sub-total M+I	***1,909***	***3.42***	***210***
Inferred	1,010	3.05	99
Total Turmalina Deposit			
Total, Measured	1,691	4.73	257
Total, Indicated	1,688	3.46	188
Total M+I	***3,379***	***4.10***	***445***
Total Inferred	1,272	3.25	133

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a cut-off grade of 1.79 g/t Au for the Turmalina deposit.
4. Mineral Resources at the Turmalina deposit include all drill hole and channel sample data as of September 13, 2023, and are depleted using mined out volumes as of July 31, 2023.
5. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au.
6. Mineral Resources are estimated using an average long term foreign exchange rate of R$5.20 : US$1.00.
7. A minimum mining width of approximately 2.0 metres was used.
8. Bulk density is 2.83 t/m^3 for Orebodies A and B and 2.91 t/m^3 for Orebody C at the Turmalina deposit.
9. Gold grades are estimated by the OK interpolation algorithm using capped composite samples.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Numbers may not sum due to rounding.

14.2.14 Factors Affecting the Mineral Resources

Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. At the present time, the SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues that may have a material impact on the Turmalina deposit Mineral Resource estimate other than those discussed below.

Factors that may affect the Turmalina deposit Mineral Resource estimates include:

- Metal price and exchange rate assumptions,
- Changes to the assumptions used to generate the cut-off grade used for construction of the mineralized wireframe domains,
- Changes to geological and mineralization shape and geological and grade continuity assumptions and interpretations,

- Due to the natural variability inherent with gold mineralization in mesothermal gold deposits, the presence, location, size, shape, and grade of the actual mineralization located between the existing sample points may differ from the current interpretation. The level of uncertainty in these items is lowest for the Measured Mineral Resource category and is highest for the Inferred Mineral Resource category,
- Changes to the understanding of the current geological and mineralization shapes and geological and grade continuity resulting from acquisition of additional geological and assay information from future drilling or sampling programs,
- Changes in the treatment of high grade gold values,
- Changes due to the assignment of density values, and
- Changes to the input and design parameter assumptions that pertain to the assumptions for creation of underground constraining volumes.

14.2.15 Comparison with Previous Mineral Resource Estimate

A comparison of the current Turmalina deposit Mineral Resources with the previous Mineral Resources effective December 31, 2021, is presented in Table 14-18.

Table 14-18: Comparison of Mineral Resources, December 31, 2021 versus July 31, 2023, Turmalina Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Mineral Resources as at December 31, 2021			
Measured	1,783	4.73	271
Indicated	2,199	3.59	254
Sub-total M+I	***3,982***	***4.10***	***525***
Inferred	2,176	3.15	221
Mineral Resources as at July 31, 2023			
Measured	1,691	4.73	257
Indicated	1,688	3.46	188
Sub-total M+I	***3,379***	***4.10***	***445***
Inferred	1,691	4.73	257
Difference			
Measured	-92	0.00	-14
Indicated	-511	-0.13	-66
Sub-total M+I	-603	0.00	-80
Inferred	-485	+1.58	+36

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources were estimated at cut-off grades of:
    a. 1.49 g/t Au in 2021

    b. 1.79 g/t Au in 2023
3. Mineral Resources are estimated using long term gold prices and long term foreign exchange rates of:
    c. US$1,800/oz Au and BRL5.50:US$1 in 2021
    d. US$1,800/oz Au and BRL5.20:US$1 in 2023
4. Bulk densities used are variable for each mineralized wireframe.
5. A minimum mining width of approximately 2.0 metres was used.
6. Gold grades are estimated using OK.
7. Mineral Resources are inclusive of Mineral Reserves.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not sum due to rounding.

14.3 Faina Deposit

14.3.1 Resource Database

Jaguar maintains a central database using the MX Deposit software, which is used to store and manage all of the digital information for all of its operations. The drill hole, trench sampling and channel sample information for the Faina deposit was extracted from this internal database into separate files for use in preparation of the Mineral Resource estimates using the Seequent Leapfrog Edge software package.

The cut-off date for the drill hole database is September 9, 2022. The drilling and sampling data was carried out using the UTM Datum Córrego Alegre, Zone 23S grid coordinate system.

A summary of the drilling and channel sampling information used to prepare the current Mineral Resource estimate is provided in Table 14-19. The location of these drill holes and channel samples were presented in Figure 10-4.

Table 14-19: Description of the Faina Deposit Database as of September 9, 2022

Table Name	Records	Length (m)
Collar	4,473	102,041
survey	36,943	N/A
assay raw	53,340	102,041
litho	22,719	102,041
weather	15,276	101,260

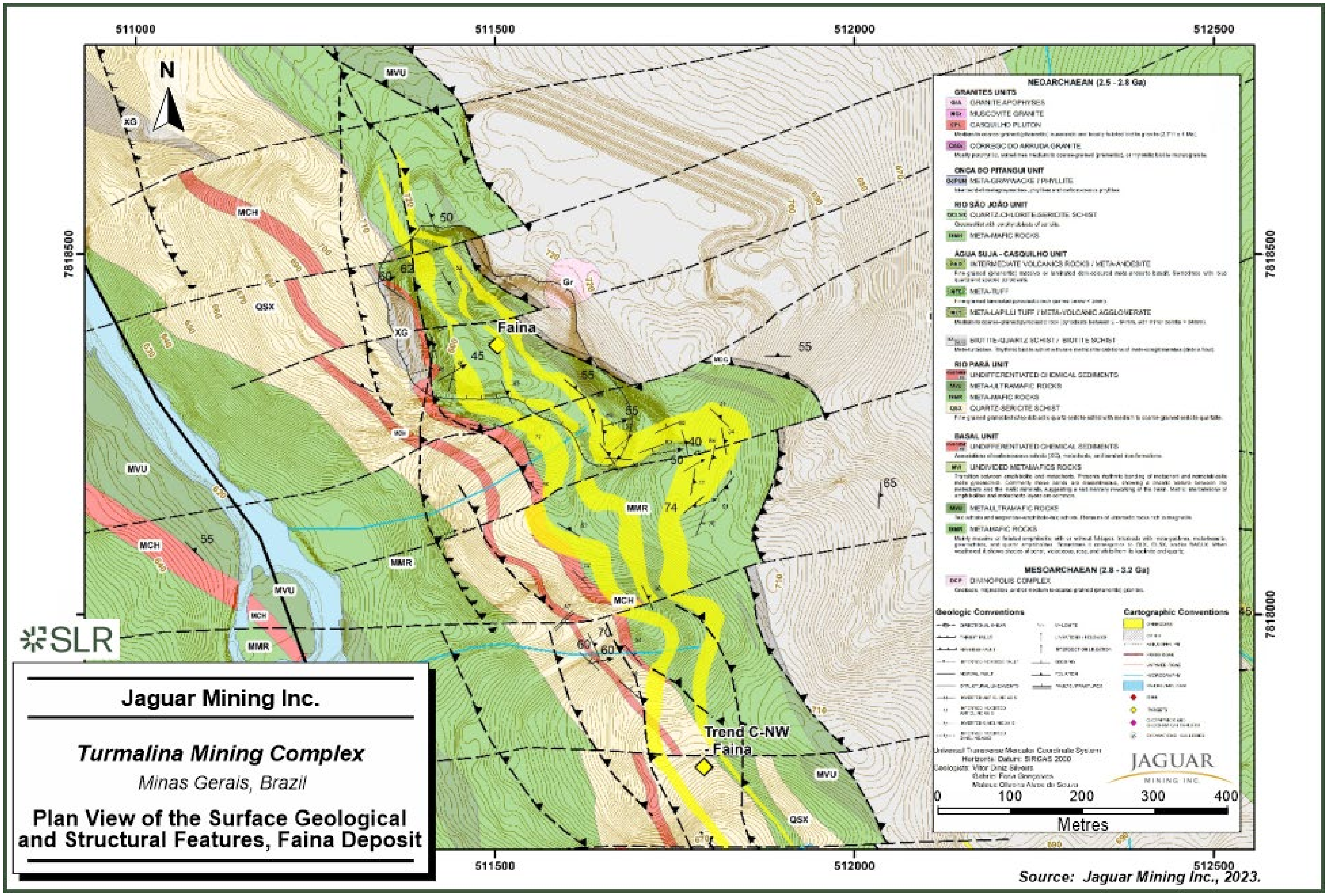
14.3.2 Geological Interpretation

14.3.2.1 Geological and Structural Wireframes

Modelling activities began with the creation of a geological model of the weathering profile using information contained within the available drill holes. The weathering surfaces were created using the Seequent Leapfrog software package.

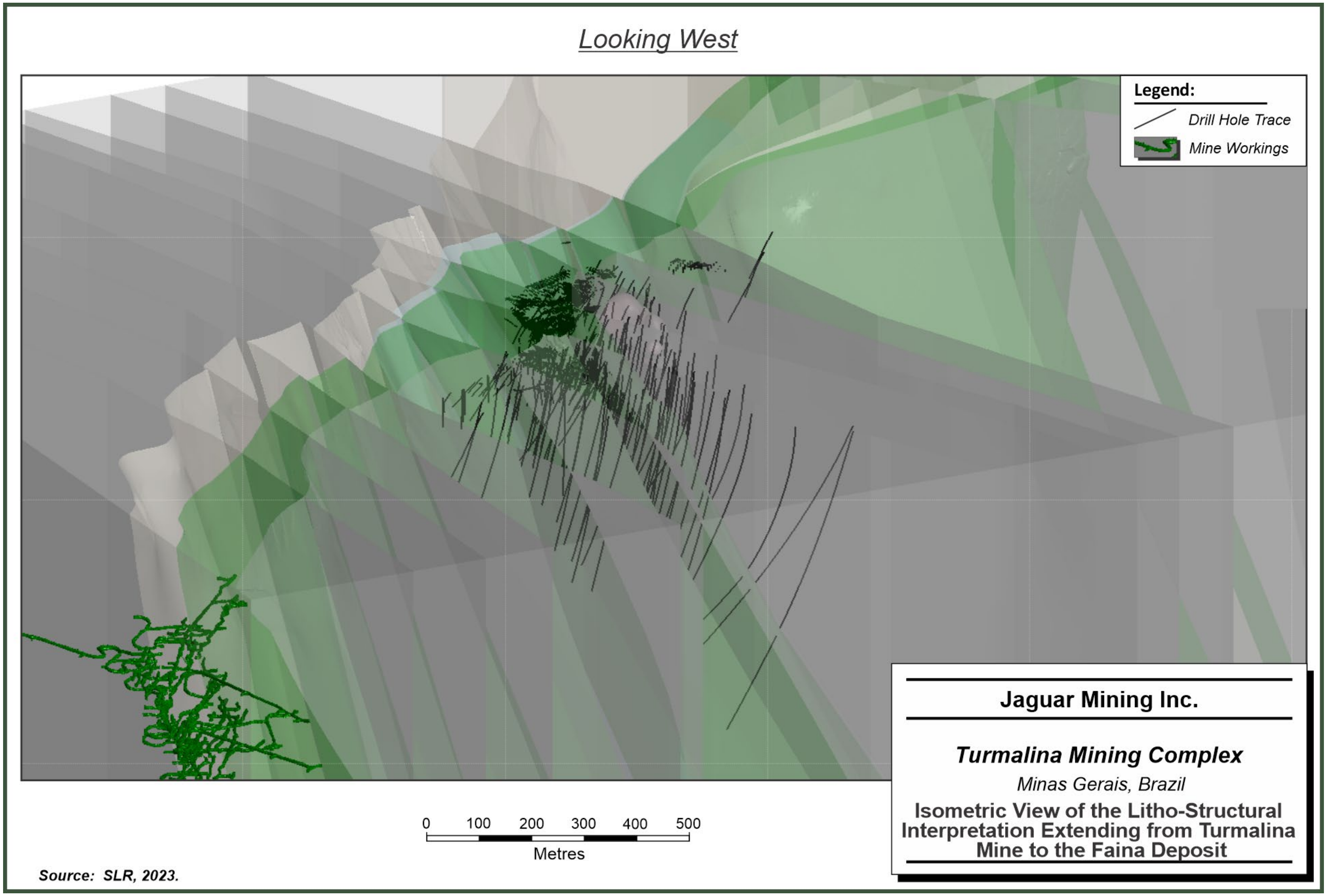
Three dimensional wireframe surfaces were also prepared of the hosting lithological units using information collected from geological mapping from available surface exposures and information from available drill holes and underground exposures (Figure 14-12). Geological wireframe models of the principle host rock units were prepared separately for each fault block as defined by the post-mineralization, northeast-striking faults identified from surface and underground geological mapping activities. Geological models were prepared for a total of 14 separate fault blocks that included the stratigraphic units from Orebody C at the Turmalina Mine to the Pontal deposits located to the northeast of the Faina deposit (Figure 14-13).

Figure 14-12: Plan View of the Surface Geological and Structural Features, Faina Deposit



Source: Jaguar Mining Inc., 2023.

Figure 14-13: Isometric View of the Litho-Structural Interpretation Extending from Turmalina Mine to the Faina Deposit



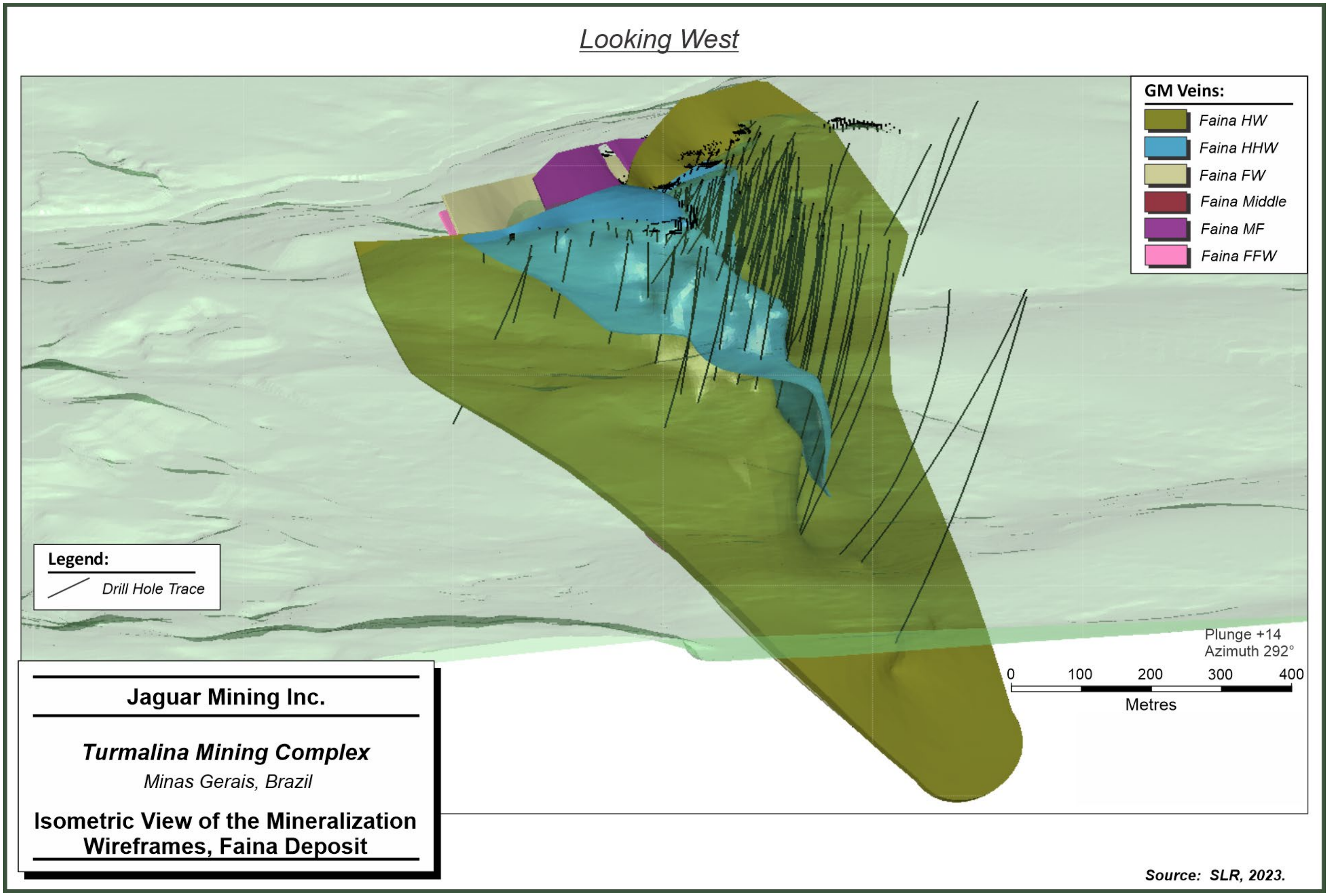
Source: SLR, 2023.

14.3.2.2 Mineralization Wireframes

Modelling activities then turned to the preparation of 3D wireframe models of the gold mineralization in the various mineralized zones using the assay values from surface and underground drill holes only. No channel samples collected from the underground exposures were used to prepare the mineralization models or estimated grades within the block model.

The mineralization wireframes were prepared using the Seequent Leapfrog software package using a nominal cut-off grade of 0.50 g/t Au. A total of six mineralization wireframes were prepared, all using a nominal minimum width of 2.0 m, as illustrated in Figure 14-14.

Figure 14-14: Isometric View of the Mineralization Wireframes, Faina Deposit



In general, the combined Faina mineralization wireframe models have been defined by drilling along a strike length of approximately 800 m to 850 m and have been traced by drilling downwards to a vertical depth of approximately 550 m to 600 m from surface. The mineralization wireframes at the Faina deposit are oriented along a general northwesterly strike direction and dip approximately -45° to the northeast.

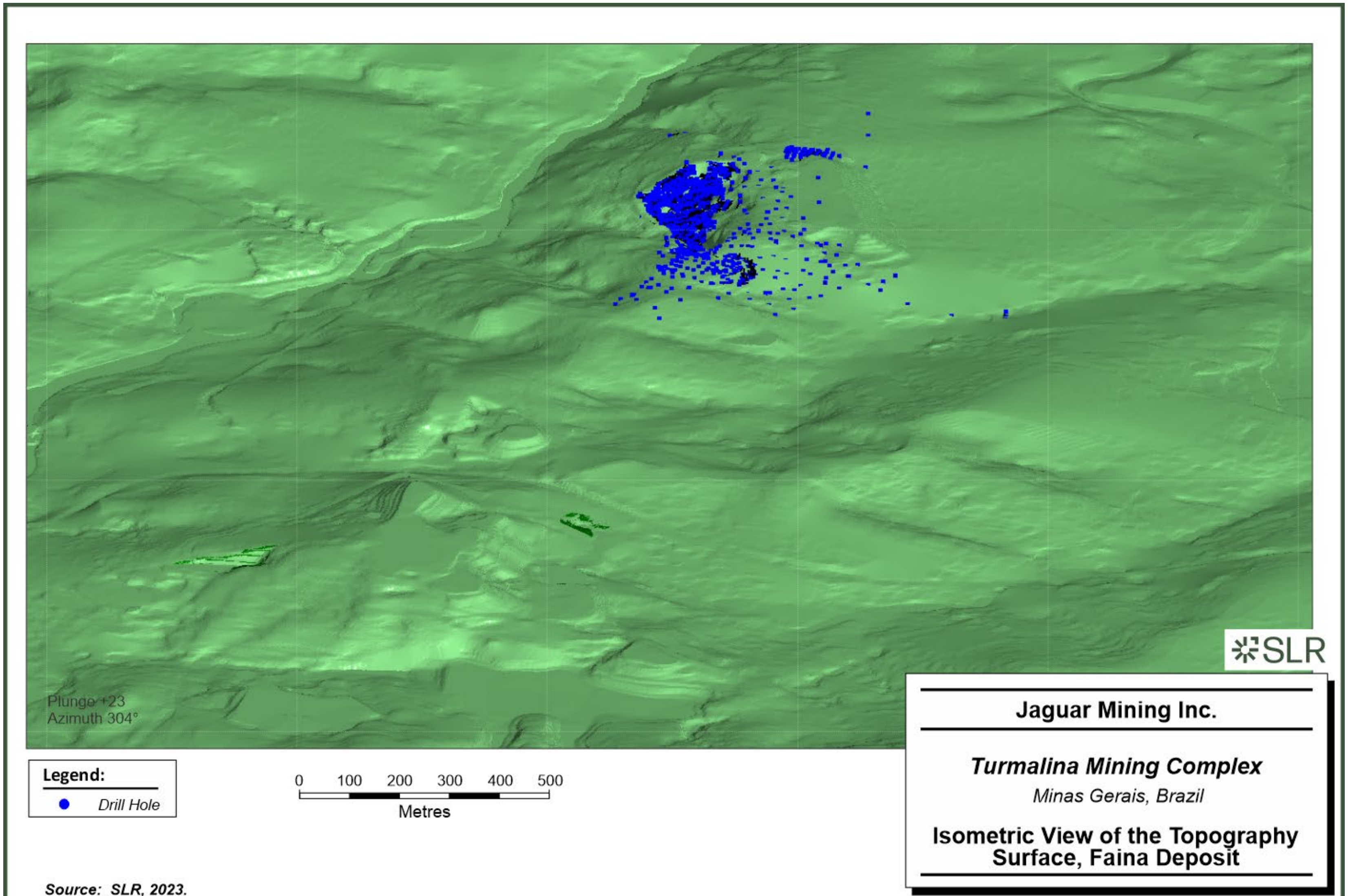
14.3.3 Topography and Excavation Models

The topographic surveys used for previous Mineral Resource estimates at Faina were developed from elevation information contained within existing contour maps. Higher resolution topographic data using a Real-Time Kinematic (RTK) positioning system were more recently acquired by Jaguar by an aerial survey and have superseded earlier topographic survey data.

An isometric view of the resulting digital topographic surface is presented in Figure 14-15.

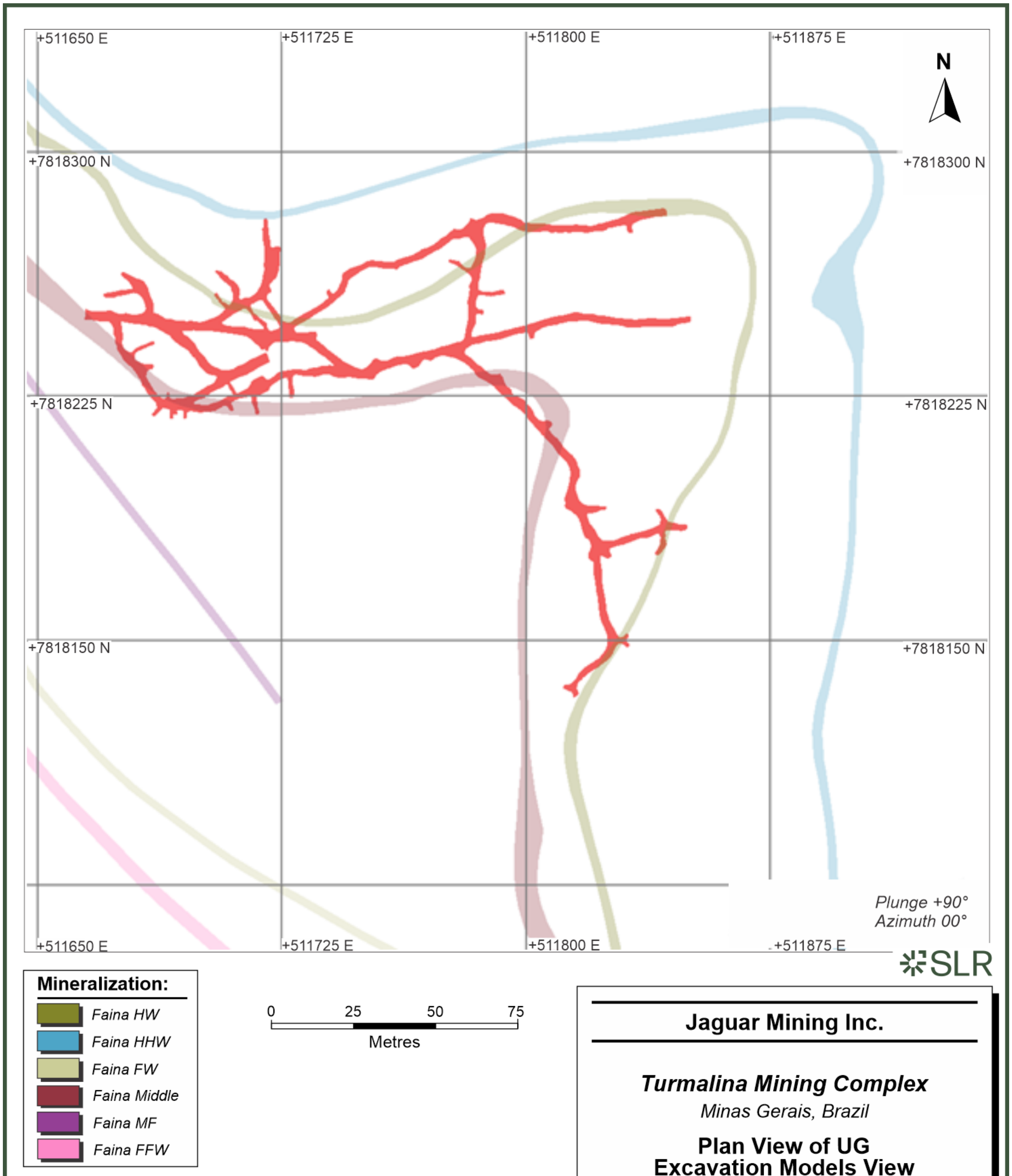
An approximation of the underground excavations was created by digitizing the outlines in plan view from historical underground mapping and sampling programs carried out at the Faina deposit. The digitized plan view strings were projected upwards by a constant distance of 2.5 m to create the solid model of the underground excavations (Figure 14-16).

Figure 14-15: Isometric View of the Topographic Surface, Faina Deposit



Source: SLR, 2023.

Figure 14-16: Plan View of the Underground Excavation Models at 665 Elevation, Faina Deposit



Source: SLR, 2023.

It is important to recall that the shallow portions of the gold mineralization at Faina hosted within the oxidized portion of the weathering profile were excavated by means of a small open pit mine. As part of the mining process the southeastern portion of the open pit mine has been partially filled in with backfill material. A model of this backfilled area was presented in RPA (2015), with the depth of the backfilled area estimated to be approximately 20 m.

14.3.4 Resource Assays and Capping

The mineralization wireframe models were used to code the drill hole database and identify the resource related samples. These samples were extracted from the database into their respective domains, and then subjected to statistical analyses by means of histograms, probability plots, and decile analyses. A combined total of 6,990 samples were contained within the six mineralized wireframes domains. These wireframes were combined into three groups for the purposes of exploratory data analysis. The sample statistics are summarized in Table 14-20.

Table 14-20: Descriptive Statistics of the Uncapped and Capped Assays, Faina Deposit

Item	Raw Assays (g/t Au)	
Statistics	**Uncapped**	**Capped**
Count	6,993	6,993
Average (g/t Au)	1.65	1.55
Minimum (g/t Au)	0.00	0.00
Maximum (g/t Au)	78.00	25.00
Standard Deviation (g/t Au)	3.93	3.14
CV	2.37	2.03

Based on their review of the assay statistics, the SLR QP is of the opinion that a capping values of 20 g/t Au, 10 g/t Au, and 25 g/t Au for the combined HW/HHW, Middle/MF, and FW/FFW domains are appropriate for the combined mineralized wireframes comprising the Faina deposit. These capping values have been applied to all gold assays prior to compositing.

The SLR QP recommends that the Faina capping values be reviewed periodically to reflect knowledge gained from production experience.

14.3.5 Compositing

The selection of an appropriate composite length began with examination of the descriptive statistics of the raw assay samples and preparation of sample length frequency histograms. Consideration was also given to the size of the blocks in the model. The SLR QP is of the opinion that a composite length of one metre for all samples is reasonable. All capped samples contained within the mineralized wireframes were composited to a constant one metre length using the compositing function of the Seequent Leapfrog software package. The composite descriptive statistics are provided in Table 14-21.

Table 14-21: Descriptive Statistics of the Capped Composite Samples, Faina Deposit

Item	Composites (g/t Au)	
Statistics	Capped	Capped (Declustered)
Count	6,404	5,570,734
Average (g/t Au)	1.54	1.51
Minimum (g/t Au)	0.00	0.00
Maximum (g/t Au)	25.00	25.00
Standard Deviation (g/t Au)	2.95	3.03
CV	1.91	2.01

14.3.6 Bulk Density

Jaguar carried out a program of systematic collection of the bulk densities of the various materials encountered at the Faina deposit using samples collected from drill holes. The bulk density values were determined by the water displacement method on selected pieces of drill core by Jaguar's laboratory staff at the Caeté site. A total of 3,007 ore and waste bulk density samples have been collected at the Faina deposit (Table 14-22).

Table 14-22: Summary of Bulk Density Measurements, Faina Deposit

Material Type	No. of Samples	Average Bulk Density (g/cm^3)
Oxide	210	1.38
Transitional	128	1.62
Fresh	2,669	2.86

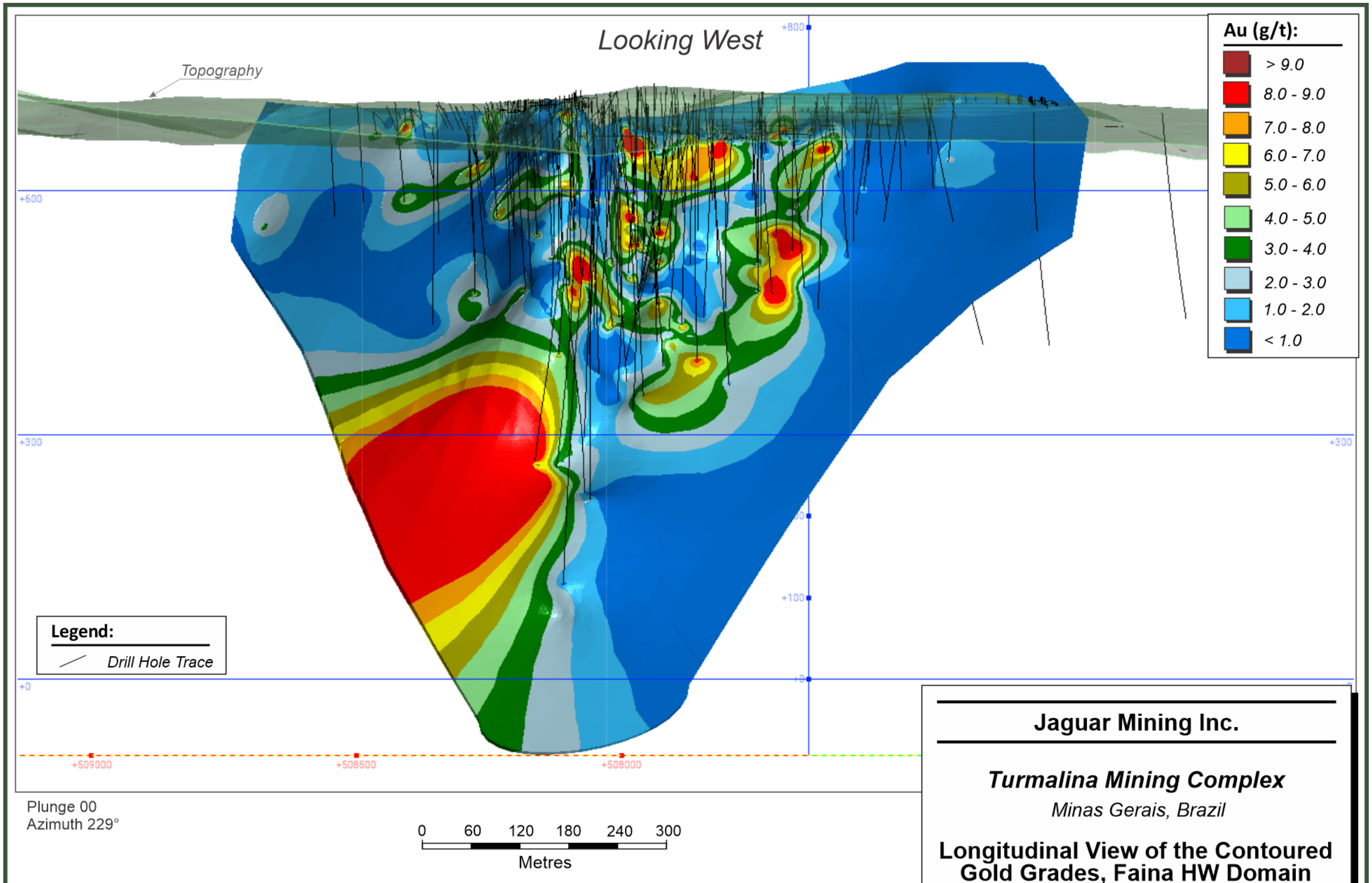
14.3.7 Trend Analysis

14.3.7.1 Grade Contouring

As an aid in carrying out variography studies of the distribution and continuity of the gold grades in the mineralized domain models, a short study to examine the overall trends was carried out for each of the mineralized lenses forming the Faina deposit. For this exercise, the one metre composited gold values for the individual lens were contoured using the Seequent Leapfrog Geo software package and an example of the contours for Faina HW are presented in Figure 14-17.

Examination of the grade contours for the Faina HW mineralized wireframe domain reveals that the gold grades exhibit a general preferred orientation along the down-dip direction with a southeasterly rake.

Figure 14-17: Longitudinal View of the Contoured Gold Grades, Faina HW Domain



Source: SLR, 2023.

14.3.7.2 Variography

Analysis of the spatial continuity of the capped, composited gold values was carried out for each of the three grouped mineralized wireframe domains for the Faina deposit using the variography function available in the Seequent Leapfrog software package. An example set of variograms is presented in Figure 14-18 and Figure 14-19, and a summary of the variogram parameters resulting from this analysis is presented in Table 14-23. A comparison of the variogram model with the contoured gold grades for the Faina HW domain is presented in Figure 14-18.

Figure 14-18: Major Axis Variogram for the HW and HHW Domains, Faina Deposit

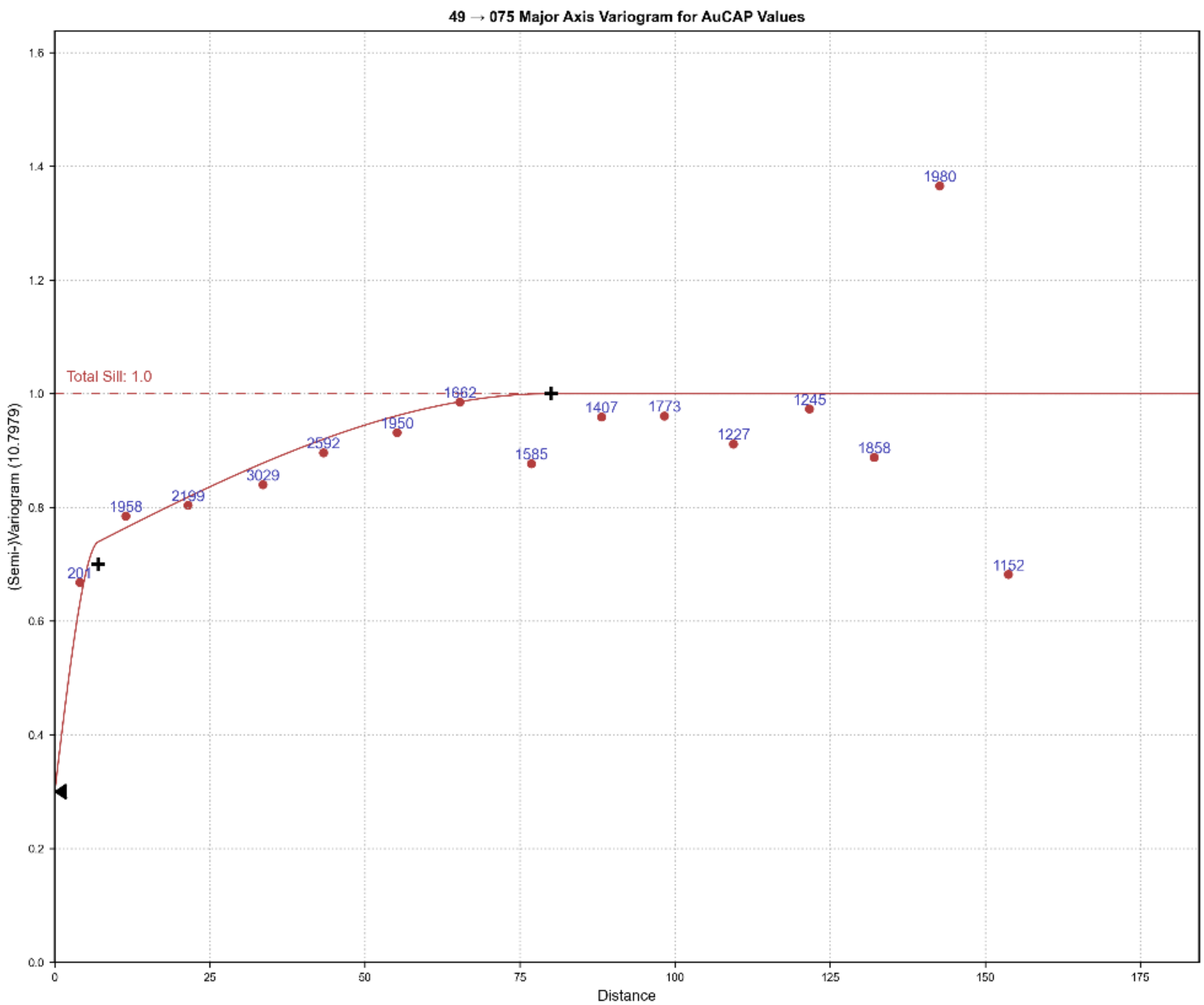


Figure 14-19: Semi-major Axis Variogram for the HW and HHW Domains, Faina Deposit

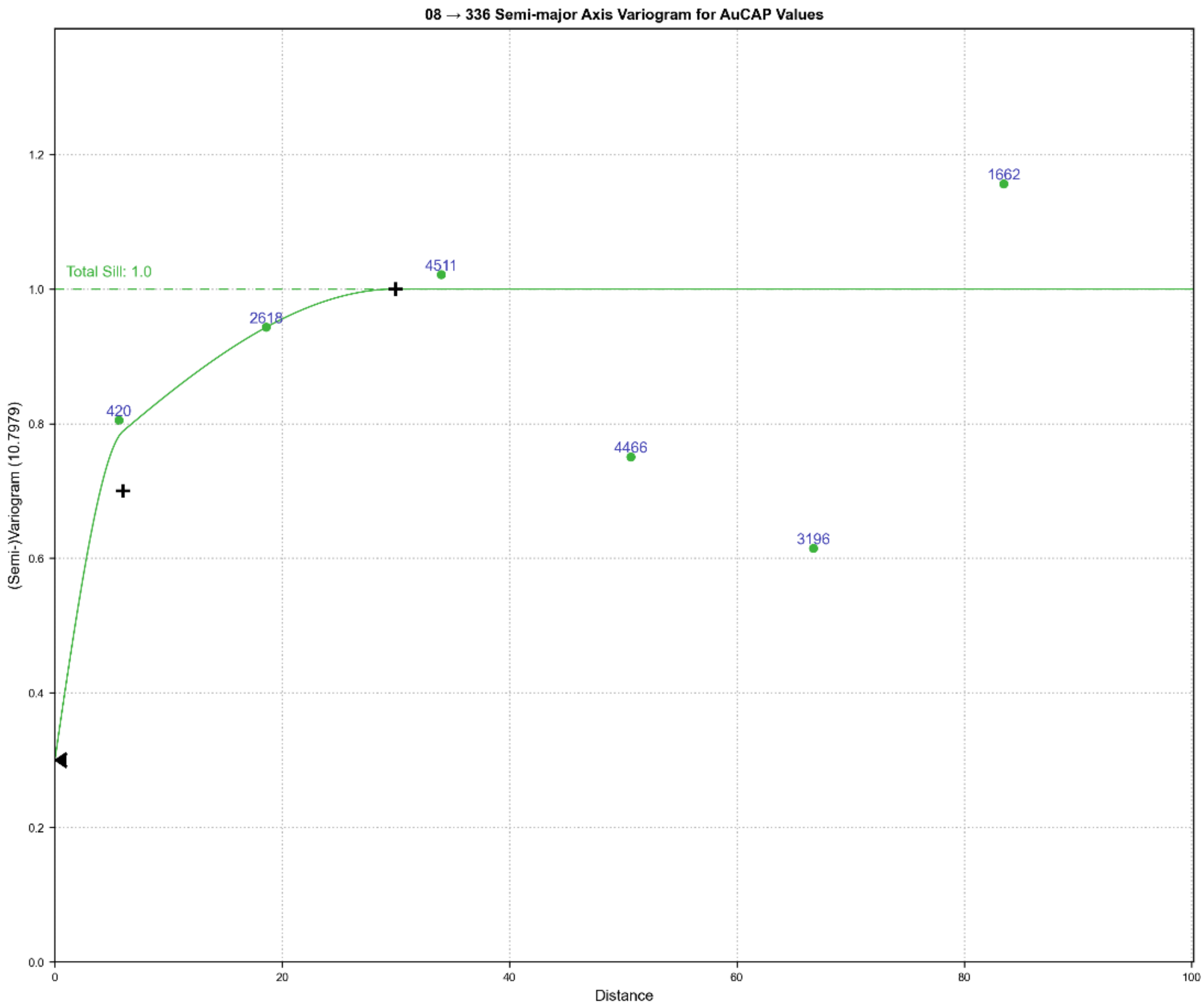


Table 14-23: Summary of Variography Parameters, Faina Deposit

Item	HW and HHW Domains	Middle and MF Domains	FW and FFW Domains
Variogram Model	Normalized Sill	Normalized Sill	Normalized Sill
Nugget (C0)	0.30	0.20	0.20
Sill Major Axis (C1)	0.40	0.55	0.47
Sill Major Axis (C2)	0.30	0.25	0.33
Model Type	Spherical	Spherical	Spherical
Orientation (Dip/Dip Az/Pitch)*	50/60/100	50/60/100	50/60/100
Structure1 Major (m)	7	5	8
Structure1 Semi-Major (m)	6	5	8

Item	HW and HHW Domains	Middle and MF Domains	FW and FFW Domains
Structure1 Minor (m)	15	5	5
Structure2 Major (m)	80	45	50
Structure2 Semi-Major (m)	30	25	40
Structure2 Minor (m)	8	8	8

Note. * Leapfrog orientation convention

14.3.8 Block Model Construction

The block model was constructed using the Seequent Leapfrog software package and comprised an array of 4 m x 4 m x 4 m sized parent blocks, sub-blocked to a minimum block size of 1.0 m x 1.0 m x 1.0 m. The model is oriented parallel to the coordinate grid system (i.e., no rotation or tilt). The block model origin, dimensions, and attribute list are provided in Table 14-24.

Attributes were created to store information such as rock code, material densities, estimated gold grades, mineral resource classification, and mined out material (Table 14-25).

Table 14-24: Block Model Definition, Faina Deposit

Type	Northing (Y)	Easting (X)	Elevation (Z)
Minimum Coordinates (m)	7,817,720	511,278	-134
Maximum Coordinates (m)	7,818,824	512,319	870
User Block Size (m)	4	4	4
Min. Block Size (m)	1	1	1
Rotation (°)	0	0	0

Table 14-25: List of Block Model Attributes, Faina Deposit

Variable Name	Description
Rclas	Classification
Step_ID3	Estimation Pass Number
Density	Bulk Density
ID3_Au	Gold Grades, Inverse Distance, Power 3
GM_Class_Indicated	Indicated Resources - Final
GM_Class_Inf_New	Inferred Resources - Final
GM_Veins_2022_Anderson_Final	Mineralized Wireframe Domains
GM_Weathering	Weathering Codes
NS	Number of Samples
NDh	Number of Drill Holes
MinD	Euclidean distance to closest sample

Variable Name	Description
AvgD	Average Euclidean distance to sample
MinAD	Anisotropic distance to closest sample
AvgAD	Average anisotropic distance to sample
EquiD	Equidistant points detected
ND	Number of duplicates removed
Dom	Domain
Est	Estimation Pass

14.3.9 Search Strategy and Grade Interpolation Parameters

Gold grades were estimated into the blocks using the Inverse Distance, Power 3 (ID^3) interpolation algorithm. A total of four interpolation passes at different ranges were carried out using distances derived from the variography results and the search ellipse parameters presented above. The orientations of the search ellipses were varied for each of the mineralized wireframes using the dynamic anisotropy function of the Seequent Leapfrog software package so as to provide a better alignment with the spatial orientations of the individual mineralized wireframes.

In general, "hard" domain boundaries were used along the contacts of the mineralized domain models for all of the mineralized lenses. Only data contained within the respective wireframe model were allowed to be used to estimate the grades of the blocks within the wireframe in question, and only those blocks within the wireframe limits were allowed to receive grade estimates. No outlier restrictions were applied when calculating the estimated grades. The block grades were estimated using the parameters presented in Table 14-26.

Table 14-26: Summary of Inverse Distance Grade Estimation Parameters, Faina Deposit

Parameters	Pass 1	Pass 2	Pass 3	Pass 4
Faina FFW Domain				
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	9	5	2	1
Maximum No. of Composites	12	12	12	8
Maximum No. Composites per Drill Hole	4	4	4	8
Major Ellipse Dimension (m)	25	50	100	1000
Semi-Major Ellipse Dimension (m)	20	40	80	800
Minor Ellipse Dimension (m)	4	8	16	160
Faina FW Domain				
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	9	5	2	1
Maximum No. of Composites	12	12	12	8

Parameters	Pass 1	Pass 2	Pass 3	Pass 4
Maximum No. Composites per Drill Hole	4	4	4	8
Major Ellipse Dimension (m)	25	50	100	1,000
Semi-Major Ellipse Dimension (m)	20	40	80	800
Minor Ellipse Dimension (m)	4	8	16	160
Faina Middle Domain				
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	9	5	2	1
Maximum No. of Composites	12	12	12	8
Maximum No. Composites per Drill Hole	4	4	4	8
Major Ellipse Dimension (m)	22.5	45	90	900
Semi-Major Ellipse Dimension (m)	12.5	25	50	500
Minor Ellipse Dimension (m)	4	8	16	160
Faina MF Domain				
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	9	5	2	1
Maximum No. of Composites	12	12	12	8
Maximum No. Composites per Drill Hole	4	4	4	8
Major Ellipse Dimension (m)	22.5	45	90	900
Semi-Major Ellipse Dimension (m)	12.5	25	50	500
Minor Ellipse Dimension (m)	4	8	16	160
Faina HW Domain				
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	9	5	2	1
Maximum No. of Composites	12	12	12	8
Maximum No. Composites per Drill Hole	4	4	4	8
Major Ellipse Dimension (m)	37.5	75	150	1,500
Semi-Major Ellipse Dimension (m)	15	30	60	600
Minor Ellipse Dimension (m)	3.5	7	14	140
Faina HHW Domain				
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic

Parameters	Pass 1	Pass 2	Pass 3	Pass 4
Minimum No. of Composites	9	5	2	1
Maximum No. of Composites	12	12	12	8
Maximum No. Composites per Drill Hole	4	4	4	8
Major Ellipse Dimension (m)	37.5	75	150	1,500
Semi-Major Ellipse Dimension (m)	15	30	60	600
Minor Ellipse Dimension (m)	3.5	7	14	140

14.3.10 Block Model Validation

Validation of the estimated block model grades included a comparison of the average of all estimated block grades to the average of the composites (Table 14-13). In consideration of such items as the volume-variance effect, projection of estimated grades beyond the limits of the drill hole information and the effect of clustered data, the average estimated block grades agree reasonably well with the average grades of the informing composites.

Table 14-27: Assay vs Composite vs Block Model Faina Deposit

Item	Raw Assays (g/t Au)		Composites (g/t Au)		Block Grades (g/t Au)	
Statistics	**Uncapped**	**Capped**	**Capped**	**Capped (Declustered)**	**Nearest Neighbour (NN)**	**Ordinary Kriging (OK)**
Count	6,993	6,993	6,404	5,570,734	5,570,734	6,993
Average	1.65	1.55	1.54	1.51	1.58	1.65
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	78.00	25.00	25.00	25.00	24.76	78.00
Sd	3.93	3.14	2.95	3.03	2.14	3.93
Variance	15.43	9.88	8.70	9.18	4.59	15.43
CV	2.37	2.03	1.91	2.01	1.36	2.37

14.3.10.1Local Estimate

A series of swath plots were prepared in which the average grade of the channel and drill hole composites and the block grades were compared by elevation (Figure 14-20, Figure 14-21, are Figure 14-22). For the swath plots, ID^3 block grades are shown in orange, the NN block grades are shown in blue and the capped composites are shown in black.

There is typically a strong agreement between the estimated ID^3 block grades and the NN block grades. As would be expected, capped composite grades show more variability locally compared to the ID3 and NN block grades.

Figure 14-20: Swath Plot by Easting, Faina Deposit (20 m bin width)

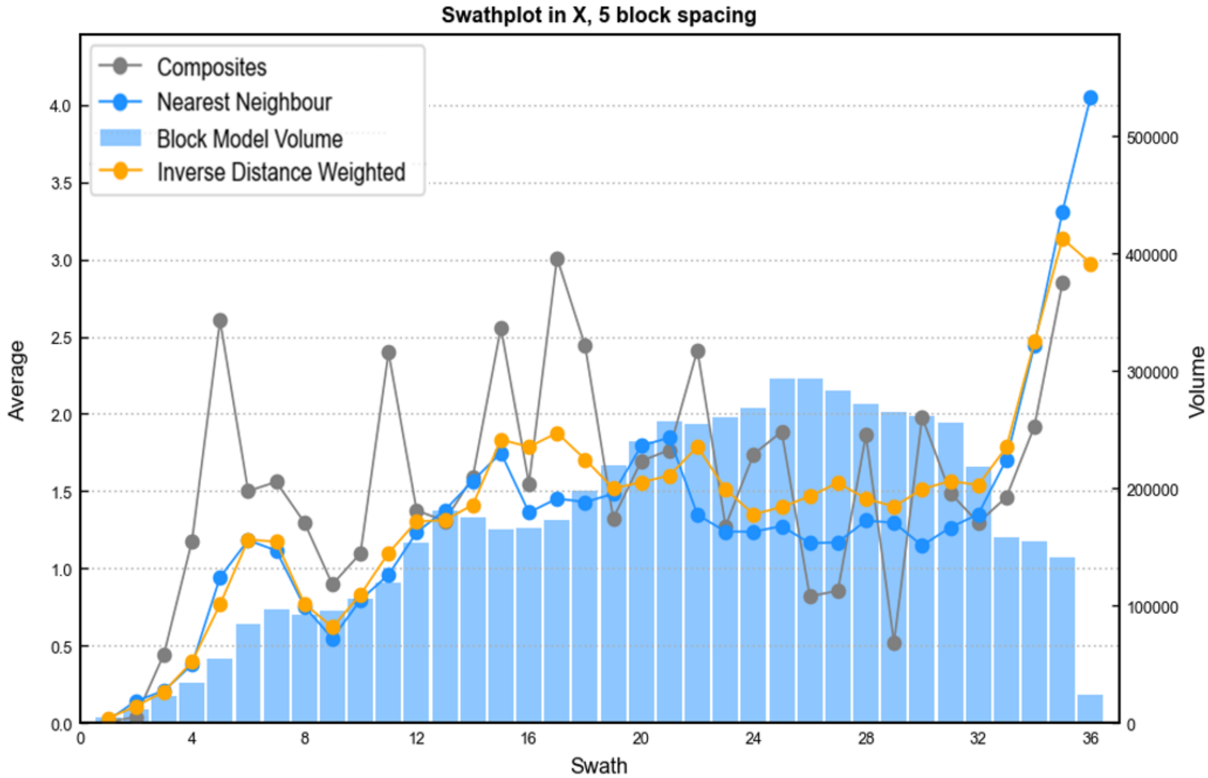


Figure 14-21: Swath Plot by Northing, Faina Deposit (20 m bin width)

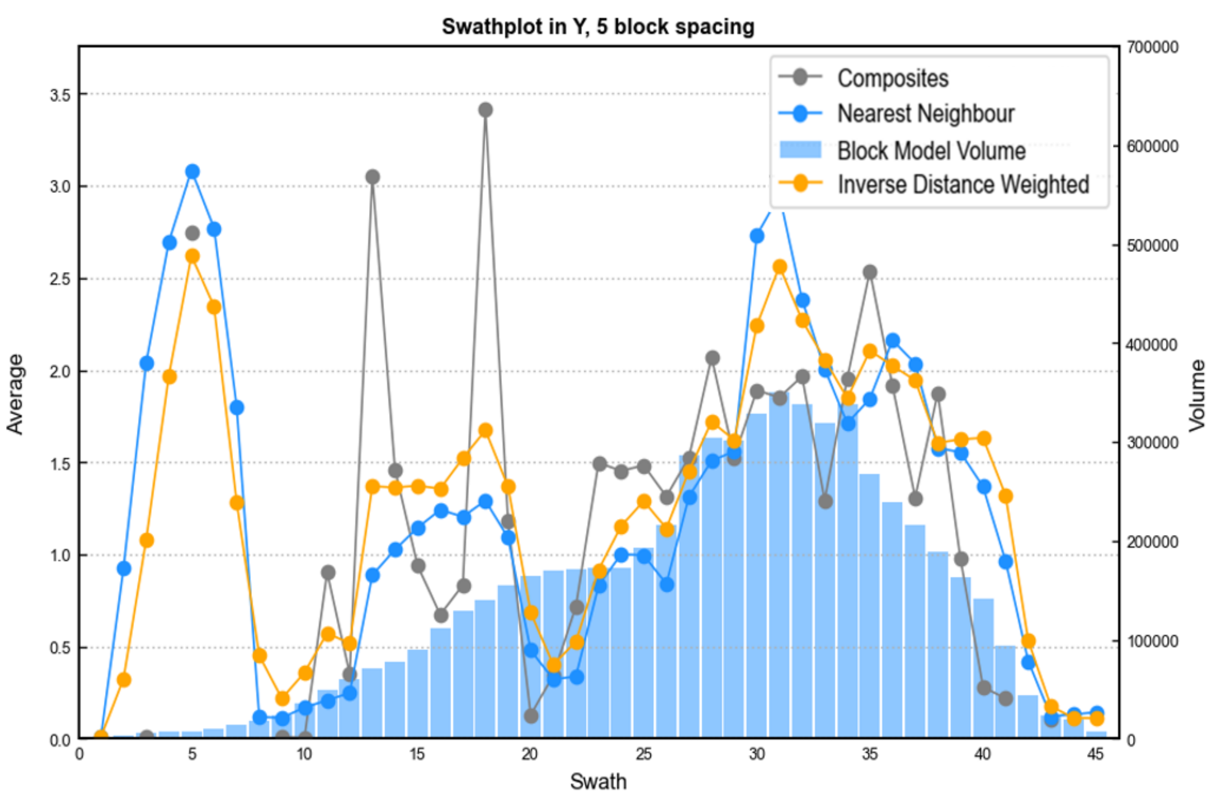
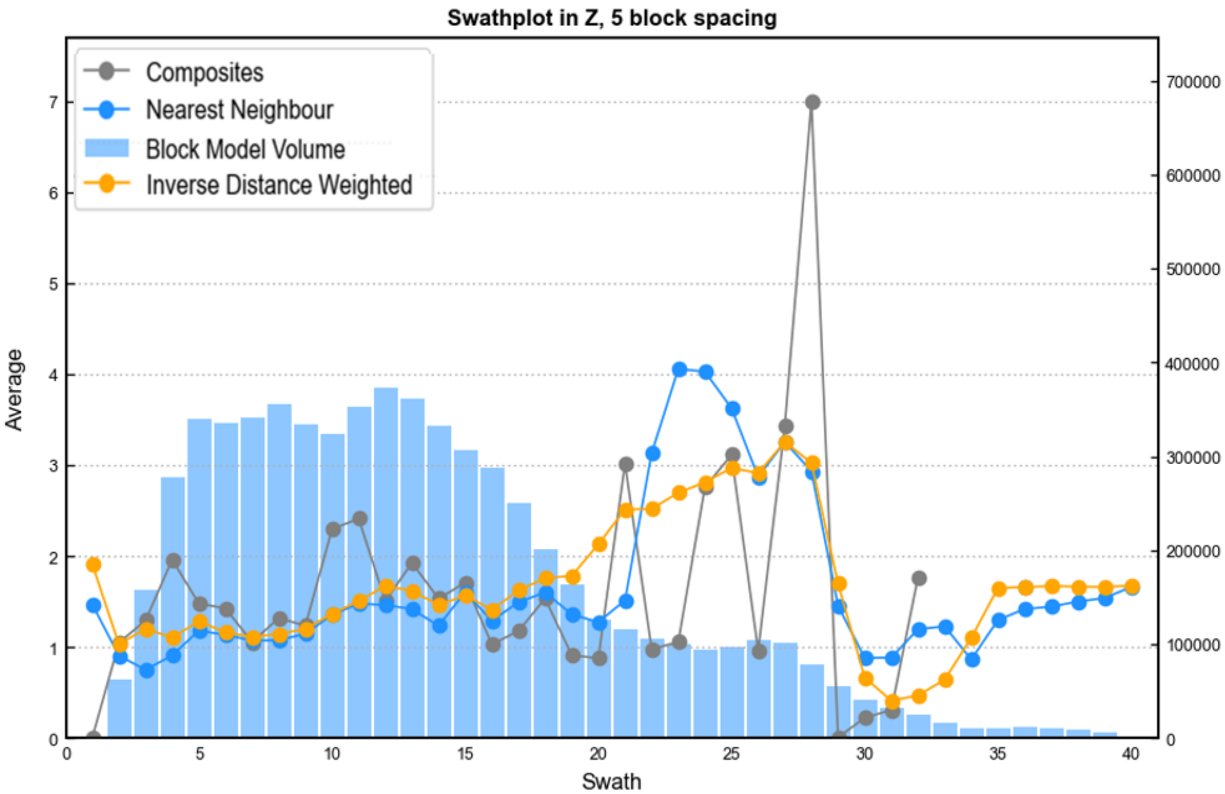


Figure 14-22: Swath Plot by Elevation, Faina Deposit (20 m bin width)



Evaluation of the accuracy of the local estimate was also carried out by visually comparing the contoured gold grades against the estimated block grades in longitudinal views.

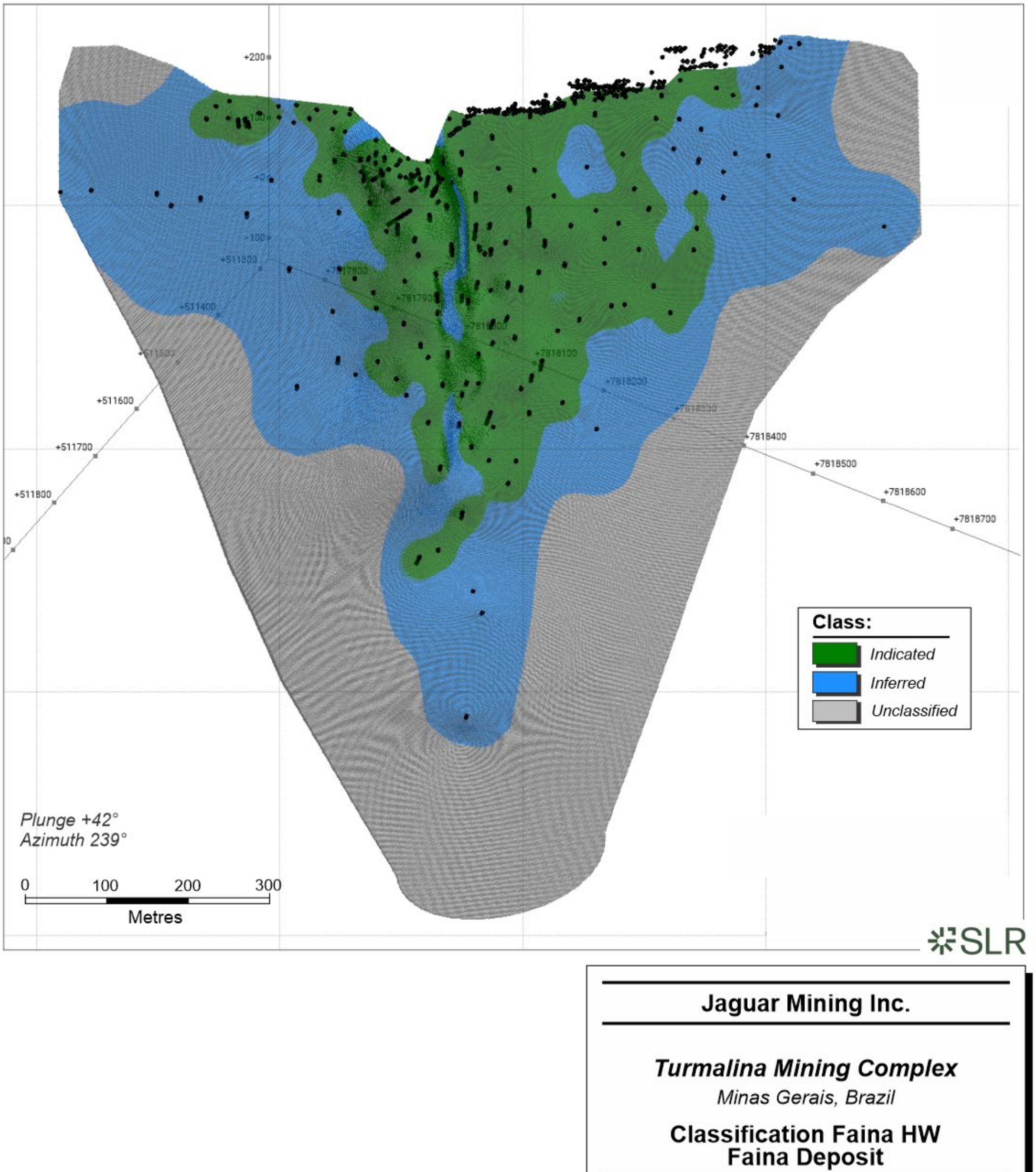
14.3.11 Mineral Resource Classification

The Mineral Resources in this Technical Report were estimated in accordance with the definitions contained in CIM (2014).

The mineralized material for each wireframe was classified into the Measured, Indicated, or Inferred Mineral Resource category based on the search ellipse ranges obtained from the variography study, the continuity of the gold mineralization, and the density of samples.

On the basis of these criteria, clipping polygons were used to create the classification and ensure continuity and consistency of the classified blocks. An example of the classification relative to the composite samples (in black) for Faina HW is presented in Figure 14-23.

Figure 14-23: Classification Faina HW, Faina Deposit



Source: SLR, 2023.

14.3.12 Cut-off Grade Parameters

A cut-off grade of 2.65 g/t Au was derived for reporting of the Mineral Resources at the Faina deposit. The cut-off grade was calculated using a gold price of US$1,800/oz, an exchange rate of BRL5.20:US$1.00, average gold recovery of 55%, and forecast 2023 operating costs for mining, processing, general and administration, taxes, and refining of BRL439.13/t (US$84.45/t). Gold prices are based on consensus, long term forecasts from banks, financial institutions, and other sources.

14.3.13 Mineral Resource Estimate

The Mineral Resources are inclusive of Mineral Reserves. Reporting panels were created using the Deswik software package to outline those portions of the mineralized wireframes containing average grades above the nominated cut-off grade.

The Mineral Resources are then a tally of all blocks contained within the reporting panels. The Mineral Resources are presented in Table 14-28.

Table 14-28: Summary of Mineral Resources as at March 30, 2023, Faina Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Measured	0	0	0
Indicated	1,427	5.08	233
Sub-total, Measured and Indicated	***1,427***	***5.08***	***233***
Inferred	1,420	5.09	232

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a cut-off grade of 2.65 g/t Au.
4. The effective date of the Mineral Resource estimate is March 30, 2023. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au.
5. Mineral Resources are estimated using an average long term foreign exchange rate of R$5.20 : US$1.00.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated by the Inverse Distance, Power 3 algorithm using capped composite samples.
8. Mineral Resources are reported using reporting panels to satisfy the “Reasonable Prospects for Eventual Economic Extraction” requirement of the CIM Definition Standards.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not sum due to rounding.

14.3.14 Factors Affecting the Mineral Resource

Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. At the present time, the SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues that may have a material impact on the Faina deposit Mineral Resource estimate other than those discussed below.

- Factors that may affect the Faina deposit Mineral Resource estimates include:
- Metal price and exchange rate assumptions,

- Changes to the assumptions used to generate the cut-off grade used for construction of the mineralized wireframe domains,
- Changes to geological and mineralization shape and geological and grade continuity assumptions and interpretations,
- Due to the natural variability inherent with gold mineralization in mesothermal gold deposits, the presence, location, size, shape, and grade of the actual mineralization located between the existing sample points may differ from the current interpretation. The level of uncertainty in these items is lowest for the Measured Mineral Resource category and is highest for the Inferred Mineral Resource category,
- Changes to the understanding of the current geological and mineralization shapes and geological and grade continuity resulting from acquisition of additional geological and assay information from future drilling or sampling programs,
- Changes in the treatment of high grade gold values,
- Changes due to the assignment of density values,
- Changes to the input and design parameter assumptions that pertain to the assumptions for creation of underground constraining volumes, and
- Changes to the assumed metallurgical recoveries.

14.3.15 Comparison with Previous Mineral Resource Estimate

A comparison of the current Faina deposit Mineral Resources with the previous Mineral Resources effective December 31, 2021 is presented in Table 14-29.

Table 14-29: Comparison of Mineral Resources, December 31, 2021 versus March 30, 2023, Faina Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Mineral Resources as at December 31, 2021			
Measured	72	7.39	17
Indicated	189	6.66	42
Sub-total M+I	***261***	***6.87***	***58***
Inferred	1,542	7.26	360
Mineral Resources as at March 30, 2023			
Measured	0	0	0
Indicated	1,427	5.08	233
Sub-total M+I	***1,427***	***5.08***	***233***
Inferred	1,420	5.09	232
Difference			
Measured	-72	-7.39	-17
Indicated	+1,355	-1.58	+191

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Sub-total M+I	***+1,166***	***-1.79***	***+175***
Inferred	-122	-2.17	-128

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources were estimated at cut-off grades of:
   a. 3.80 g/t Au in 2021
   b. 2.65 g/t Au in 2023
3. Mineral Resources are estimated using long term gold prices and long term foreign exchange rates of:
   a. US$1,800/oz Au and BRL2.50 in 2021
   b. US$1,800/oz Au and BRL5.20 in 2023
4. A minimum mining width of approximately two metres was used.
5. Gold grades are estimated using Ordinary Kriging (2021) and Inverse Distance, Power 3 (2023).
6. Mineral Resources are inclusive of Mineral Reserves.
7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
8. Numbers may not sum due to rounding.

14.4 Pontal Deposits

14.4.1 Resource Database

Jaguar maintains a central database using the MX Deposit software, which is used to store and manage all of the digital information for all of its operations. The drill hole database for the Pontal deposits was extracted from this internal database into separate files to use in the preparation of the Mineral Resource estimates. The extracted data includes surface and underground drill holes. Surface trench samples and underground channel samples were excluded from the estimation. The drill hole data include both historical-based samples collected by MMV and samples more recently collected by Jaguar. It is to be noted that Jaguar has elected to rename the mineralized zones at the Pontal Deposit as listed in Table 14-30.

Table 14-30: List of Revised Zone Names, Pontal Deposit

Previous Zone Name	Revised Zone Name
LB1	CE
LB2	NW
Pontal South (new discovery)	SE

The cut-off date for the drill hole database is September 9, 2022. The drilling and sampling data was carried out using the UTM Datum Córrego Alegre, Zone 23S grid coordinate system. A summary of the resource database is provided in Table 14-31. The locations of these drill holes are presented in Figure 14-24

This drill hole information was modified slightly to be compatible with the format requirements of the Seequent Leapfrog software and was then imported into that software package. A number of new tables were created during the estimation process as required to capture such information as the intersection information between the drill holes and the wireframe models, density readings, capped assay records, and composited assay records.

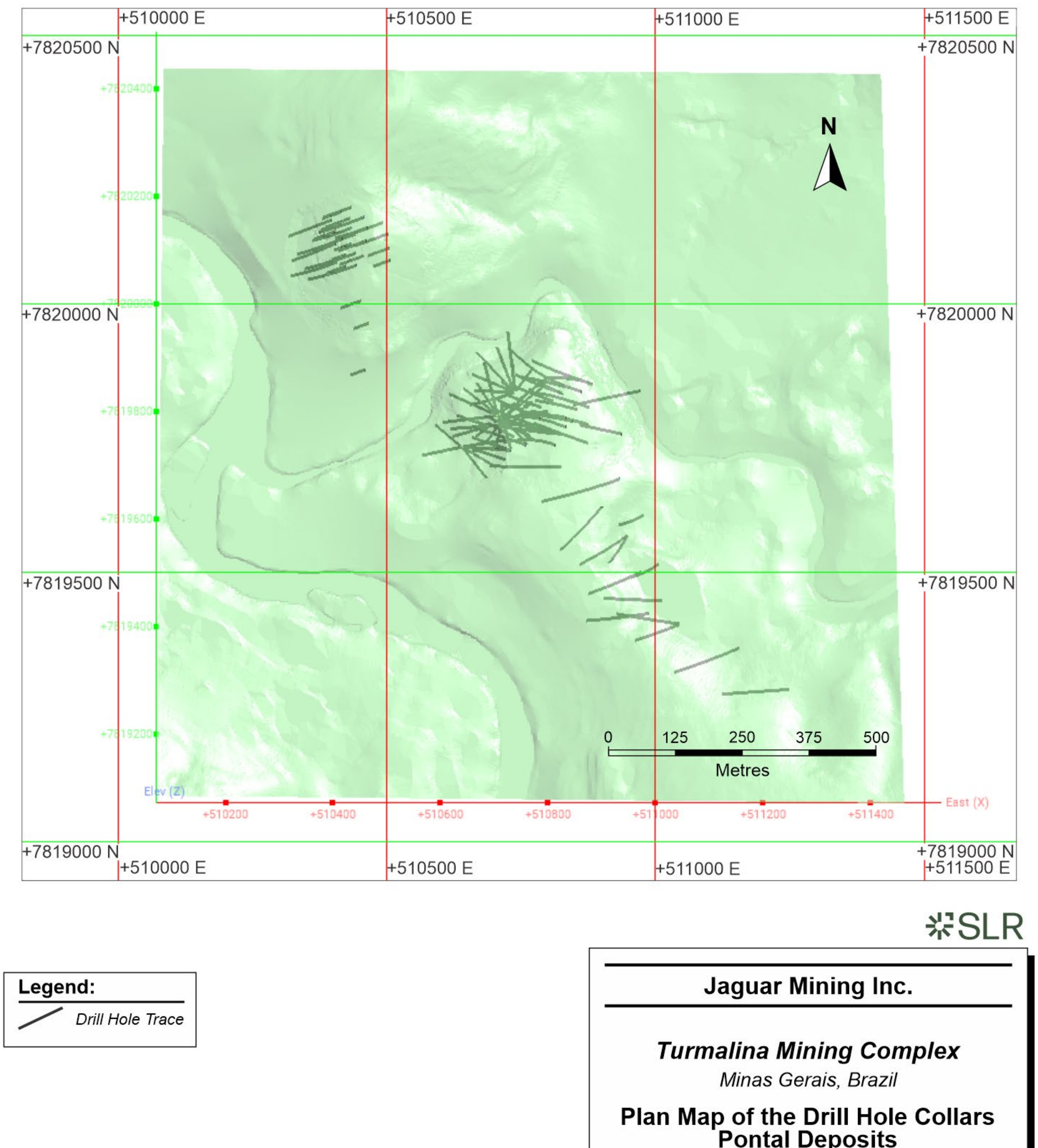
The database included assay records which contained entries of negative values to represent intervals of no sampling, lost core, lost sample, or no core recovery, some of which are contained within the mineralized wireframes. SLR refers to these intervals of absent assay data as null values. Depending upon the specific local conditions, these null values can introduce an undesired positive bias upon the grade estimations. Jaguar therefore elected to pursue a conservative approach by inserting a very low gold value of 0.01 g/t Au for these intervals of null values.

The SLR QP is of the opinion that the drill hole and sampling database is suitable for use in preparation of Mineral Resource estimates. Figure 14-24 provides the Pontal deposits drill hole sample locations relative to the mineralized wireframes.

Table 14-31: Description of the Pontal Deposit Database as of September 9, 2022

Table Name	Records	Length (m)
Collar:		
NW (formerly LB2)	27	2,472
CE (formerly LB1)	85	11,505
SE (Pontal South (new))	14	3,430
Total	126	17,407
survey	3,482	N/A
assay	14,635	17,407
geology	1,853	17,407
weather	306	17,407
density	785	N/A

Figure 14-24: Plan Map of the Drill Hole Collars, Pontal Deposits



Source: SLR, 2023.

14.4.2 Mineralization Wireframes

Modelling activities began with the creation of a geological model of the weathering profile using information contained within the available drill holes. The weathering surfaces were created using the Seequent Leapfrog software package.

Three dimensional wireframe surfaces were also prepared of the hosting lithological units using information collected from geological mapping from available surface exposures and information from available drill holes and underground exposures.

Modelling activities then turned to the preparation of 3D wireframe models of the gold mineralization in the three mineralized zones using the assay values from surface and underground drill holes only. No channel samples collected from the underground exposures were used to prepare the mineralization models or estimated grades within the block model.

The mineralization wireframes were prepared using the Seequent Leapfrog software package. Two sets of mineralization wireframe were drawn using nominal cut-off grades of 0.20 g/t Au (low grade) and 1.0 g/t Au (high grade). The low grade domain cut-off grade threshold was defined based on a contact analysis that was conducted to establish a marginal gold grade that would enable the differentiation of the hydrothermal alteration zones. The high grade wireframes were enclosed within the low grade wireframes. All wireframes were drawn using a nominal minimum width of 2.0 m. The wireframe models were clipped to the topographic surface. A total of 27 individual wireframe models were created, including 12 wireframes for the CE (formerly LB1) deposit, nine wireframes for the NW (formerly LB2) deposit, and six wireframes for the SE deposit. Only the high grade mineralization wireframes were used to prepare estimated grades within the block model (Figure 14-25).

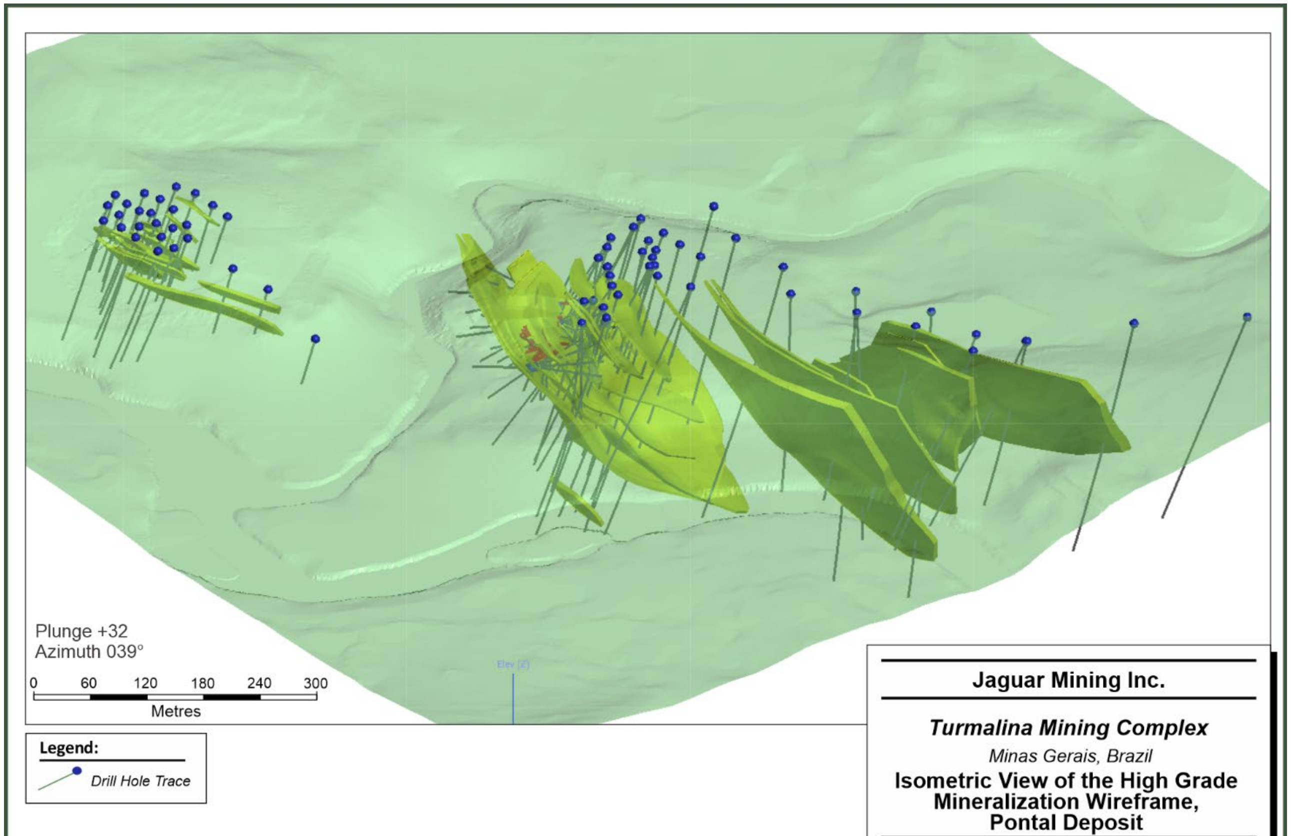
In general, the CE wireframe models measure approximately 300 m x 300 m in plan view and have been traced by drilling downwards to a vertical depth of approximately 250 m to 300 m from surface. The mineralization wireframes at the CE deposit are oriented along a general northeasterly strike direction and dip approximately -60° to the southeast.

The mineralization wireframes at the NW deposit display a general northwesterly strike of approximately 335° and have been traced by drill hole and trench sampling along a strike length of approximately 250 m to 300 m. The wireframes generally dip at approximately -45° to the northeast and extend to a depth of approximately 75 m to 100 m from surface.

The mineralization wireframes at the SE deposit are modelled with arcuate shapes having northerly to north-northwesterly strike directions and having dips of approximately -60° to the east. The mineralization at the SE deposit has been traced by widely spaced drill holes along a strike length of approximately 350 m to 400 m and to depths of approximately 250 m to 300 m from surface.

SLR notes that there is previous underground development at Pontal. SLR recommends that attempts be made to better integrate underground sampling at Pontal with existing wireframe interpretation where data quality permits.

Figure 14-25: Isometric View of the High Grade Mineralization Wireframes, Pontal Deposit



Source: SLR, 2023.

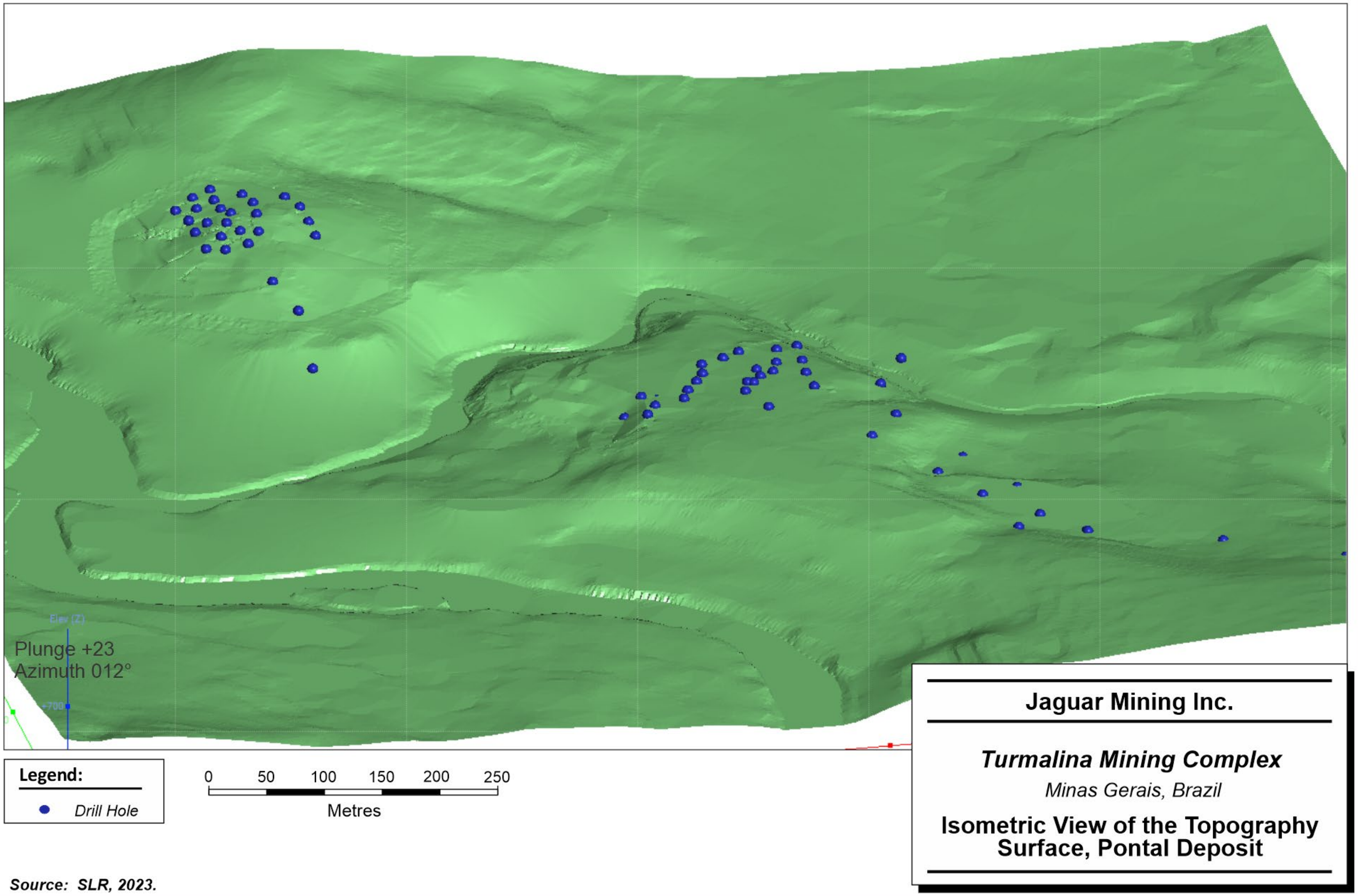
14.4.3 Topography and Excavation Models

The topographic surveys used for previous Mineral Resource estimates at Pontal were developed from elevation information contained within existing contour maps. Higher resolution topographic data using a Real-Time Kinematic (RTK) positioning system were more recently acquired by Jaguar by an aerial survey and have superseded earlier topographic survey data.

An isometric view of the resulting digital topographic surface is presented in Figure 14-26.

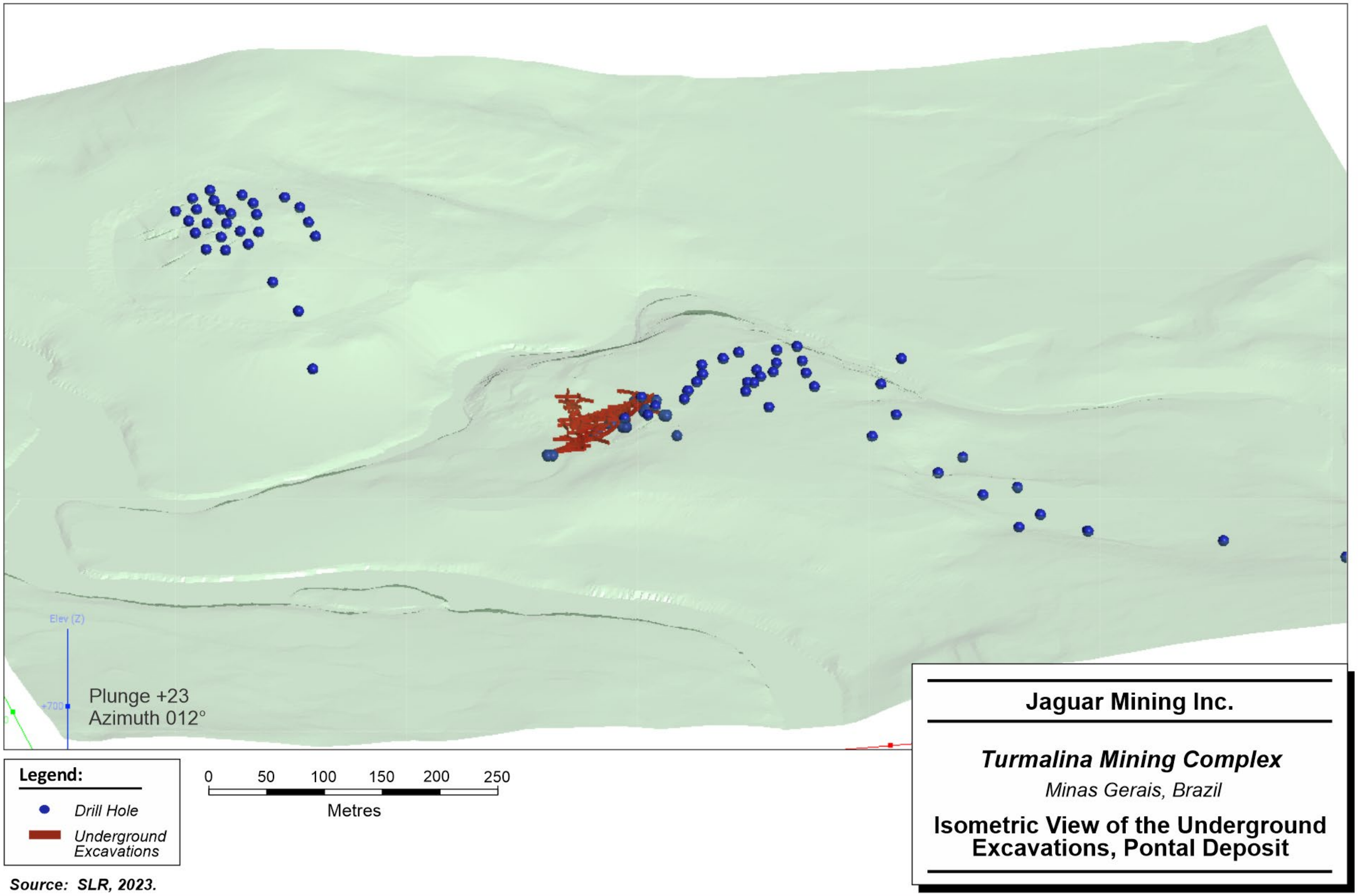
An approximation of the underground excavations was created by digitizing the outlines in plan view from historical underground mapping and sampling programs carried out at the CE (formerly LB1) deposit. The digitized plan view strings were projected upwards by a constant distance of 2.5 m to create the solid model of the underground excavations. In total, two levels were excavated – the upper level was excavated at a toe elevation of approximately 609 m and the lower level was excavated at a toe elevation of approximately 603 m (Figure 14-27).

Figure 14-26: Isometric View of the Topographic Surface, Pontal Deposit



Source: SLR, 2023.

Figure 14-27: Isometric View of the Underground Excavations, Pontal Deposit



Source: SLR, 2023.

14.4.4 Resource Assays and Capping

The mineralization wireframe models were used to code the drill hole database and identify the resource related samples. These samples were extracted from the database and then subjected to statistical analyses by means of histograms. A combined total of 3,978 samples were contained within the mineralized wireframes. The sample statistics are summarized in Table 14-32.

Based on their review of the assay statistics, the SLR QP is of the opinion that a capping value of 30 g/t Au is a reasonable selection for the combined mineralized wireframes comprising the Pontal deposit. This capping value remains unchanged from that discussed in RPA (2015). This capping value has been applied to all gold assays prior to compositing.

Table 14-32: Descriptive Statistics of the Uncapped and Capped Gold Assays, High Grade Wireframes, Pontal Deposit

Item	Raw Assays (g/t Au)	
Statistics	Uncapped	Capped
Count	3,599	3,599
Average	1.83	1.80
Minimum	0.01	0.01
Maximum	60.75	30.00
Sd	3.18	2.81
Variance	10.14	7.92
CV	1.74	1.56

14.4.5 Compositing

The selection of an appropriate composite length began with examination of the descriptive statistics of the raw assay samples and preparation of sample length frequency histograms. Consideration was also given to the size of the blocks in the model. The SLR QP is of the opinion that a composite length of one metre for all samples is reasonable. All capped samples contained within the mineralized wireframes were composited to a constant one metre length using the compositing function of the Seequent Leapfrog software package. The composite descriptive statistics are provided in Table 14-33.

Table 14-33: Descriptive Statistics of the Capped Composite Samples, Pontal Deposit

Item	Composites (g/t Au)
Statistics	Capped
Count	2,510
Average	1.80
Minimum	0.01
Maximum	30.00

Item	Composites (g/t Au)
Statistics	Capped
Sd	2.60
Variance	6.77
CV	1.44

14.4.6 Bulk Density

Jaguar continued to carry out a program of systematic collection of the bulk densities of the various materials encountered at the Pontal deposit using samples collected from drill holes. The bulk density values were determined by the water displacement method on selected pieces of drill core by Jaguar's laboratory staff at the Caeté site. A total of 785 ore and waste bulk density samples have been collected at Pontal (Table 14-34).

Table 14-34: Summary of Bulk Density Measurements, Pontal Deposit

	No. of Samples			Average Bulk Density (g/cm^3)		
Material Type	NW	CE	SE	NW	CE	SE
Oxidized	44	25	26	1.47	1.45	1.74
Transitional	28	4	11	2.50	2.41	2.24
Fresh	112	175	360	2.80	2.82	2.80

14.4.7 Variography

Figure 14-28 shows the analysis of the spatial continuity of the capped, composited gold grades contained within the high grade mineralized wireframe models of the CE Zone. A summary of the variogram parameters is presented in Table 14-35.

Figure 14-28: Major and Semi-Major Axis Variograms for the High Grade Wireframe, CE Mineralized Zone, Pontal Deposit

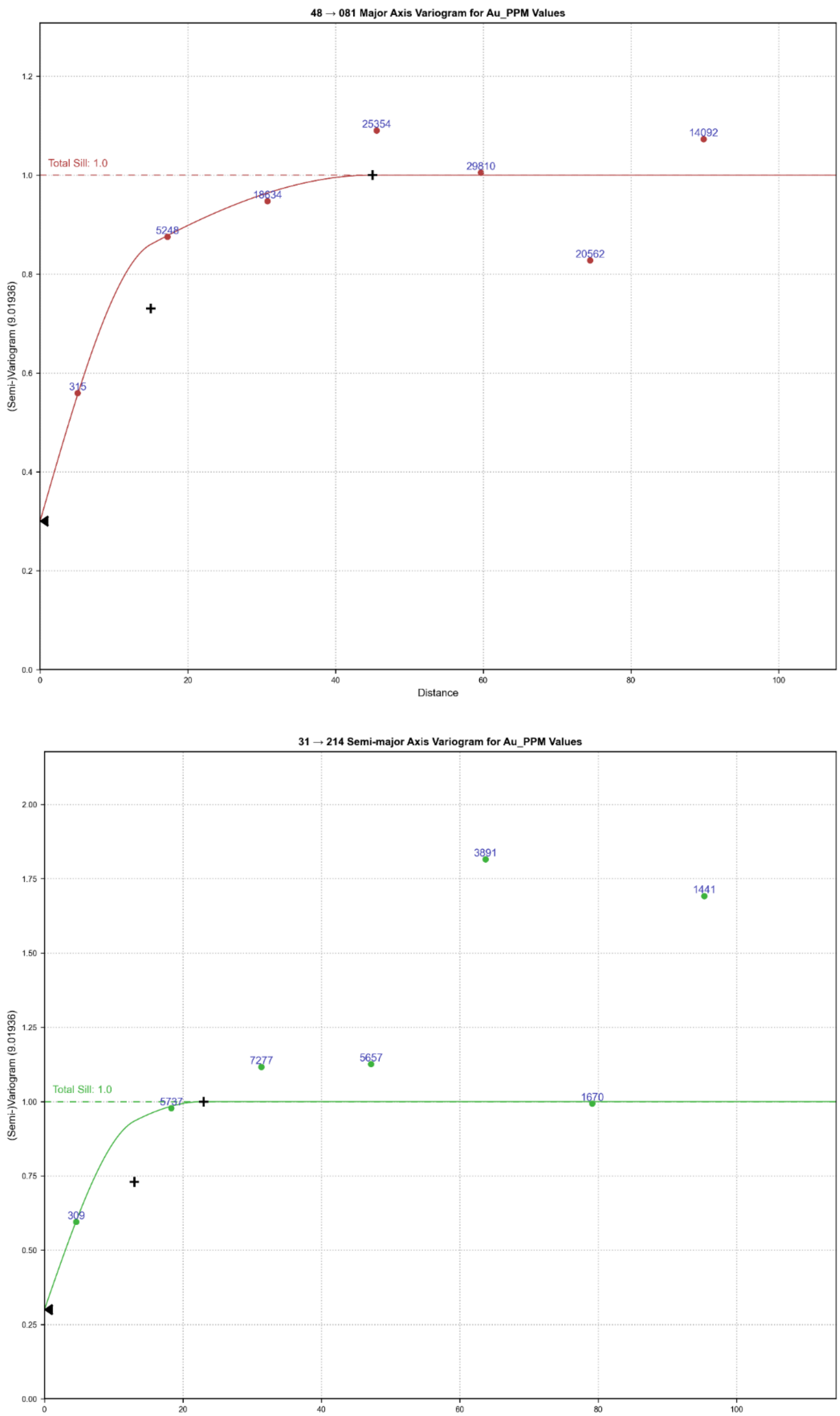


Table 14-35: Summary of Variogram Parameters, Pontal Deposit

Item	CE Zone	NW Zone	SE Zone
Variogram Model	Normalized Sill	Normalized Sill	Normalized Sill
Nugget (C0)	0.30	0.30	0.30
Sill Major Axis (C1)	0.43	0.30	0.43
Sill Major Axis (C2)	0.27	0.40	0.27
Model Type	Spherical	Spherical	Spherical
Orientation (Dip/Dip Az/Pitch)*	65/140/55	043/080/80	60/080/85
Structure1 Major (m)	15	30	15
Structure1 Semi-Major (m)	13	15	13
Structure1 Minor (m)	1.5	2	1.5
Structure2 Major (m)	45	45	45
Structure2 Semi-Major (m)	23	23	23
Structure2 Minor (m)	3	2.5	3

* Leapfrog orientation convention

14.4.8 Block Model Construction

The block model was constructed using the Seequent Leapfrog software package and comprised an array of 4 m x 4 m x 4 m sized parent blocks, sub-blocked to a minimum block size of 1.0 m x 1.0 m x 1.0 m. The model is oriented parallel to the coordinate grid system (i.e., no rotation or tilt). The block model origin, dimensions, and attribute list are provided in Table 14-36.

Attributes were created to store information such as rock code, material densities, estimated gold grades, mineral resource classification, and mined out material (Table 14-37).

Table 14-36: Block Model Definition, Pontal Deposit

Type	Northing (Y)	Easting (X)	Elevation (Z)
Minimum Coordinates (m)	510,200	7,819,200	200
Maximum Coordinates (m)	511,300	7,820,300	800
User Block Size (m)	4	4	4
Min. Block Size (m)	1.0	1.0	10
Rotation (°)	0.000	0.000	0.000

Table 14-37: List of Block Model Attributes, Pontal Deposit

Variable Name	Description
auokc	Gold by Ordinary Kriging
class_rule	Initial classification

Variable Name	Description
class_rule_smooth	Final classification
dens	Material Density
rock	Mineralization Wireframe ID
target	Zone ID

14.4.9 Search Strategy and Grade Interpolation Parameters

Gold grades were estimated into the blocks using the ordinary kriging interpolation algorithm. A total of four interpolation passes at different ranges were carried out using distances derived from the variography results and the search ellipse parameters presented above. The orientations of the search ellipses were varied for each of the mineralized wireframes using the dynamic anisotropy function of the Seequent Leapfrog software package so as to provide a better alignment with the spatial orientations of the individual mineralized wireframes.

In general, "hard" domain boundaries were used along the contacts of the mineralized domain models for all of the mineralized lenses. Only data contained within the respective wireframe model were allowed to be used to estimate the grades of the blocks within the wireframe in question, and only those blocks within the wireframe limits were allowed to receive grade estimates. The estimated grades were carried out using a search restriction on a wireframe-by-wireframe basis in order to prevent undue influence of high grade assays to the local grade estimate. The block grades were estimated using the parameters presented in Table 14-38.

Table 14-38: Summary of Kriging Grade Estimation Parameters, Pontal Deposit

Parameters	Pass 1	Pass 2	Pass 3	Pass 4
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	8	5	5	1
Maximum No. of Composites	12	12	8	8
Maximum No. Composites per Drill Hole	4	4	4	8
Discretization	4x4x4	4x4x4	4x4x4	4x4x4
Major Ellipse Dimension (m)	22.5	45	90	180
Semi-Major Ellipse Dimension (m)	11.5	23	46	92
Minor Ellipse Dimension (m)	5	5	10	60

14.4.10 Block Model Validation

Validation of the estimated block model grades included a comparison of the average of all estimated block grades to the average of the composites (Table 14-13). In consideration of such items as the volume-variance effect, projection of estimated grades beyond the limits of the drill hole information and the effect of clustered data, the average estimated block grades agree reasonably well with the average grades of the informing composites.

Table 14-39: Assay vs Composite vs Block Model Pontal Deposit

Item	Raw Assays (g/t Au)	Composites (g/t Au)		Block Grades (g/t Au)	
Statistics	Uncapped	Capped	Capped	Nearest Neighbour (NN)	Ordinary Kriging (OK)
Count	3,599	3,599	2,510	797,325	797,325
Average	1.83	1.80	1.80	1.87	1.85
Minimum	0.01	0.01	0.01	0.01	0.01
Maximum	60.75	30.00	30.00	20.00	14.40
Sd	3.18	2.81	2.60	2.09	1.29
Variance	10.14	7.92	6.77	4.36	1.65
CV	1.74	1.56	1.44	1.12	0.70

14.4.10.1Local Estimate

A series of swath plots were prepared in which the average grade of the channel and drill hole composites and the block grades were compared by elevation (Figure 14-29, Figure 14-30, and Figure 14-31). For the swath plots, OK block grades are shown in orange, the NN block grades are shown in blue and the capped composites are shown in black.

There is typically a strong agreement between the estimated Inverse Distance Weighted block grades and the NN block grades. As would be expected, capped composite grades show more variability locally compared to the OK and NN block grades.

Figure 14-29: Swath Plot by Easting, Pontal Deposits (12 m bin width)

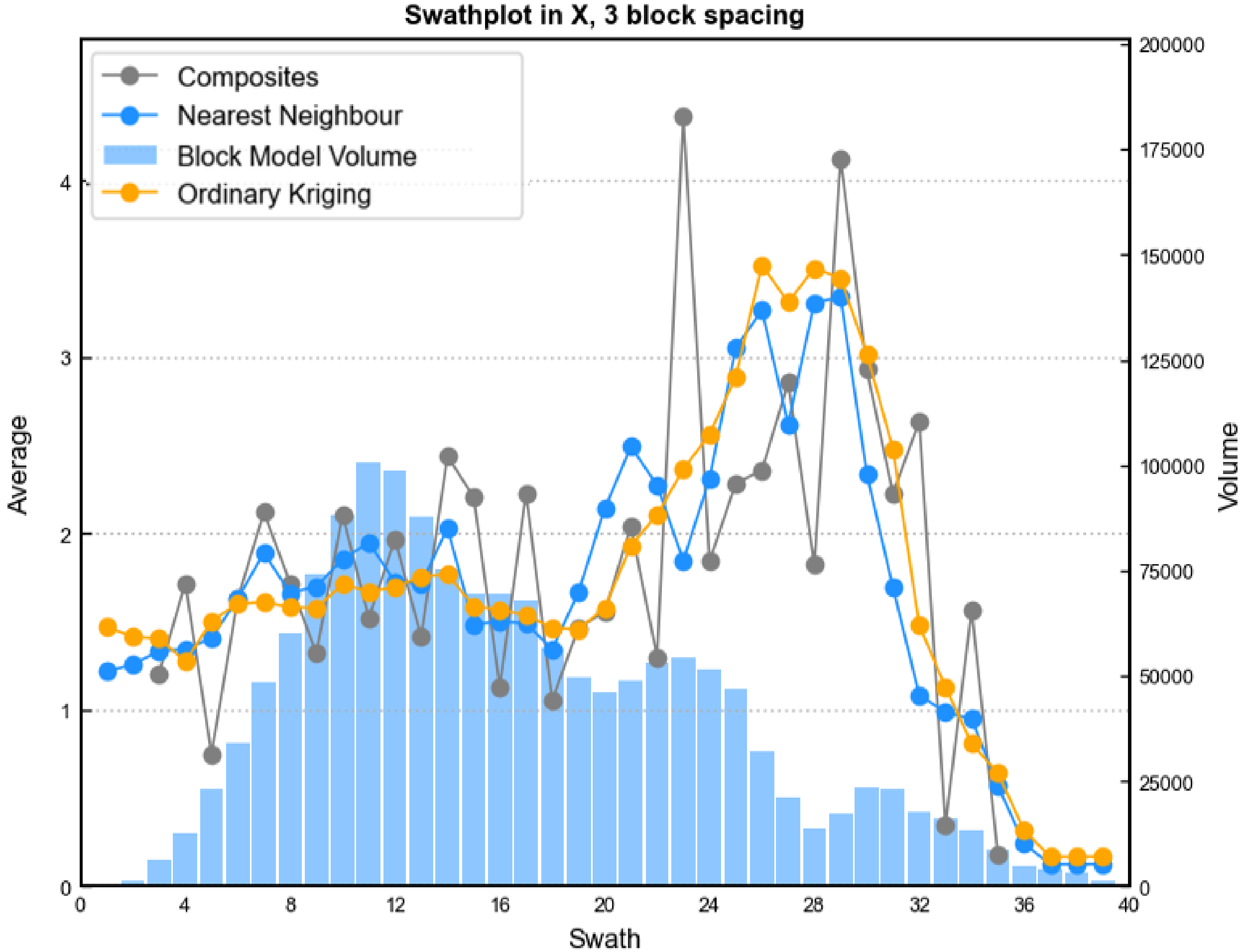


Figure 14-30: Swath Plot by Northing, Pontal Deposits (16 m bin width)

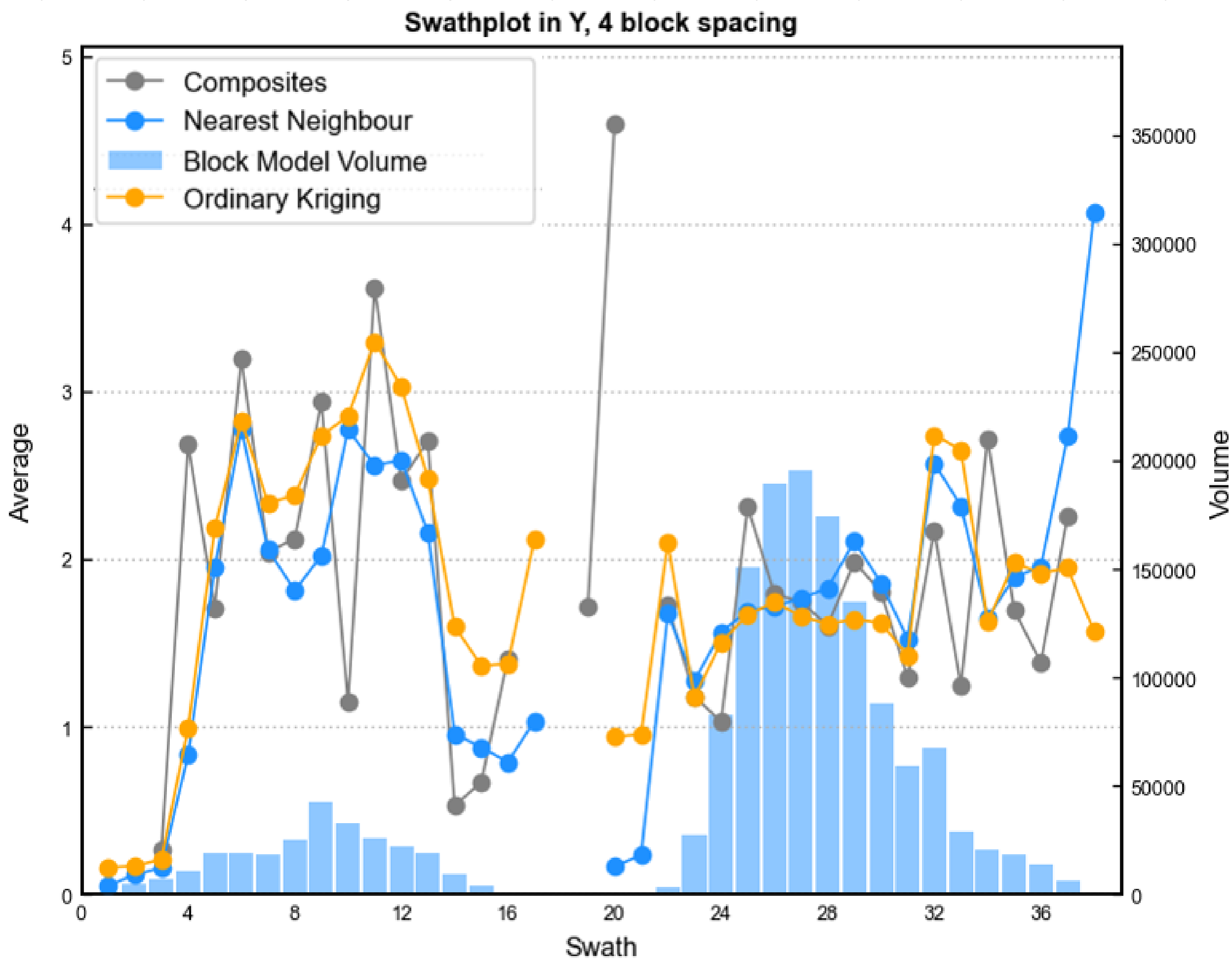
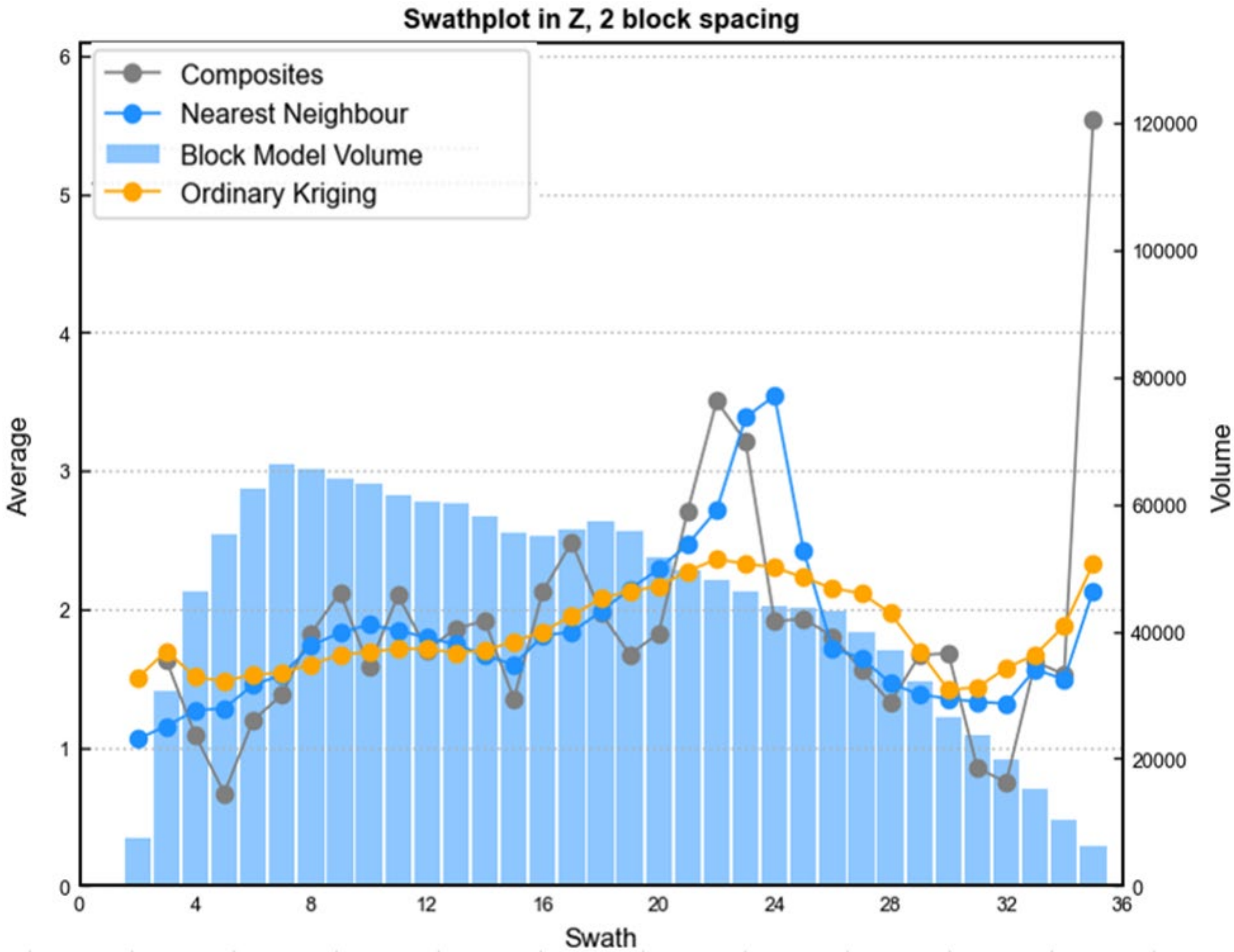


Figure 14-31: Swath Plot by Elevation, Pontal Deposits (8 m bin width)



Evaluation of the accuracy of the local estimate was also carried out by visually comparing the contoured gold grades against the estimated block grades in longitudinal views.

14.4.11 Mineral Resource Classification

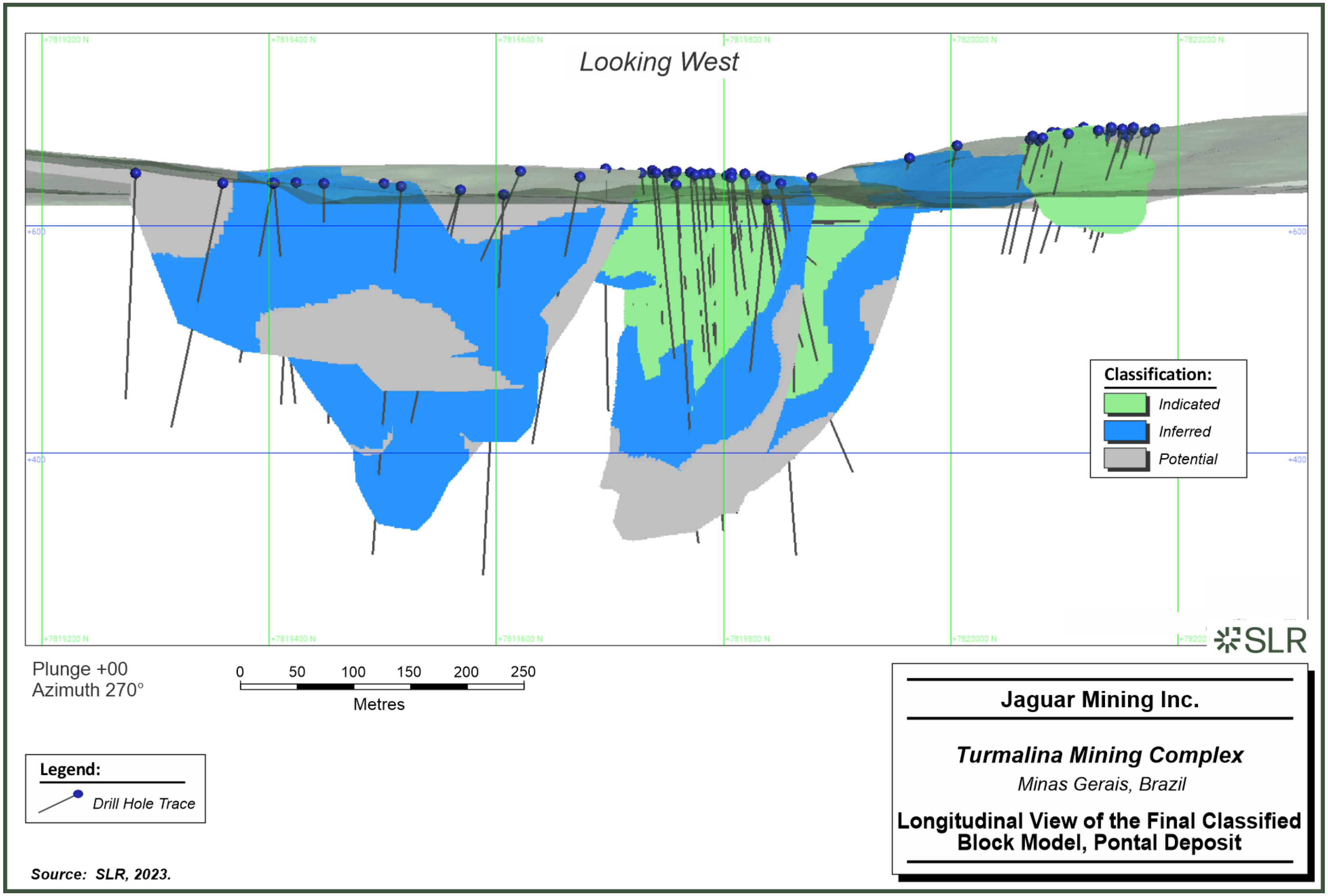
All material contained within the mineralized wireframe domains at the Pontal deposit were initially classified into either the Measured, Indicated, or Inferred Mineral Resource category using the average distance of informing samples and number of drill holes used for the grade estimate as the primary criteria (Table 14-40).

Table 14-40: Summary of Initial Mineral Resource Classification Criteria, Pontal Deposit

Initial Classification	Average Distance of Informing Samples (m)	Number of Informing Drill Holes
1 (Measured)	<=15	>=3
2 (Indicated)	<=35	>=2
3 (Inferred)	<=70	>=1

The initial classification codes were subsequently reviewed and smoothed using an inverse distance estimation approach so as to provide areas within each of the mineralized wireframes of consistent Mineral Resource classification codes. A view of the classified block model is provided in Figure 14-32.

Figure 14-32: Longitudinal View of the Final Classified Block Model, Pontal Deposit



Source: SLR, 2023.

14.4.12 Cut-off Grade Parameters

An initial cut-off grade of 2.52 g/t Au was calculated using a gold price of US$1,800/oz, an exchange rate of BRL5.20:US$1.00, average gold recovery of 58.0%, and forecast 2023 operating costs for mining, processing, general and administration, taxes, and refining of BRL439.13/t (US$84.45/t). This compares with a cut-off grade of 2.90 g/t Au that was used to prepare the December 31, 2022 Mineral Resource statement. Gold prices are based on consensus, long term forecasts from banks, financial institutions, and other sources.

Upon review and consideration, Jaguar subsequently elected to adopt a conservative approach and apply a higher cut-off grade than required based on the input parameters. This approach is similar to the one defined for Faina, for reporting the Mineral Resources. This revised cut-off grade of 3.00 g/t Au was used to prepare clipping polygons to create appropriate volumes for reporting of the Mineral Resources. The Mineral Resource statements thus represent all blocks contained within the constraining volumes that meet the minimum width criteria and have not been mined out.

14.4.13 Mineral Resource Estimate

The Mineral Resources are inclusive of Mineral Reserves. Clipping polygons were used to outline those portions of the mineralized wireframes containing average grades above the nominated cut-off grade. Jaguar elected to adopt a slightly conservative approach when preparing the clipping polygons, therefore a nominal cut-off grade of 3.0 g/t Au was applied for their preparation.

The Mineral Resources are then a tally of all blocks contained within the clipped mineralized wireframe volumes. The Mineral Resources are presented in Table 14-41.

Table 14-41: Summary of Mineral Resources as of November 30, 2023, Pontal Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Pontal CE & NW (formerly LB1 & LB2) deposits			
Indicated	266	3.44	29
Inferred	159	4.72	24
Pontal SE (Pontal South) deposit			
Inferred	669	3.76	81
Total, Pontal			
Indicated	266	3.44	29
Inferred	828	3.94	105

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a cut-off grade of 3.0 g/t Au.
4. The effective date of the Mineral Resource estimate is November 30, 2023. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au.
5. Mineral Resources are estimated using an average long term foreign exchange rate of R$5.20 : US$1.00.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated by the OK interpolation algorithm using capped composite samples.

8. Mineral Resources are reported using clipping polygons to define all blocks located within the trimmed portion of the mineralization wireframes.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not sum due to rounding.

14.4.14 Factors Affecting the Mineral Resource

Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. At the present time, the SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues that may have a material impact on the Pontal deposits Mineral Resource estimate other than those discussed below.

- Factors that may affect the Pontal deposits Mineral Resource estimates include:
- Metal price and exchange rate assumptions,
- Changes to the assumptions used to generate the cut-off grade used for construction of the mineralized wireframe domains,
- Changes to geological and mineralization shape and geological and grade continuity assumptions and interpretations,
- Due to the natural variability inherent with gold mineralization in mesothermal gold deposits, the presence, location, size, shape, and grade of the actual mineralization located between the existing sample points may differ from the current interpretation. The level of uncertainty in these items is lowest for the Measured Mineral Resource category and is highest for the Inferred Mineral Resource category,
- Changes to the understanding of the current geological and mineralization shapes and geological and grade continuity resulting from acquisition of additional geological and assay information from future drilling or sampling programs,
- Changes in the treatment of high grade gold values,
- Changes due to the assignment of density values,
- Changes to the input and design parameter assumptions that pertain to the assumptions for creation of underground constraining volumes, and
- Changes to the assumed metallurgical recoveries.

14.4.15 Comparison with Previous Mineral Resource Estimate

A comparison of the current Pontal deposit Mineral Resources with the previous Mineral Resources effective December 31, 2021 is presented in Table 14-42.

Table 14-42: Comparison of Mineral Resources, December 31, 2021 versus November 30, 2023, Pontal Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Mineral Resources as at December 31, 2021			
Measured	251	5.00	40
Indicated	159	4.28	22
Sub-total M+I	***410***	***4.72***	***62***

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Inferred	950	3.14	96
Mineral Resources as at November 30, 2023			
Measured	0	0	0
Indicated	266	3.44	29
Sub-total M+I	***266***	***3.44***	***29***
Inferred	828	3.94	105
Difference			
Measured	-251	-5.00	-40
Indicated	+107	-0.84	+7
Sub-total M+I	***-144***	***1.28***	***-33***
Inferred	122	+0.80	+9

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources were estimated at cut-off grades of:
   a. 2.90 (Pontal) and 2.02 g/t Au (Pontal South) g/t Au in 2021
   b. 3.0 g/t Au in 2023
3. Mineral Resources are estimated using long term gold prices and long term foreign exchange rates of:
   a. US$1,800/oz Au and BRL5.50 in 2021
   b. US$1,800/oz Au and BRL5.20 in 2023
4. A minimum mining width of approximately two metres was used.
5. Gold grades are estimated using Ordinary Kriging.
6. Mineral Resources are inclusive of Mineral Reserves.
7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
8. Numbers may not sum due to rounding.

14.5 Zona Basal Deposit

14.5.1 Resource Database

Jaguar maintains a central database using the MX Deposit software, which is used to store and manage all of the digital information for all of its operations. The RC drill hole and trench sampling sample information for the Zona Basal deposit was extracted from this internal database into separate files for use in preparation of the Mineral Resource estimates using the Leapfrog Edge software package.

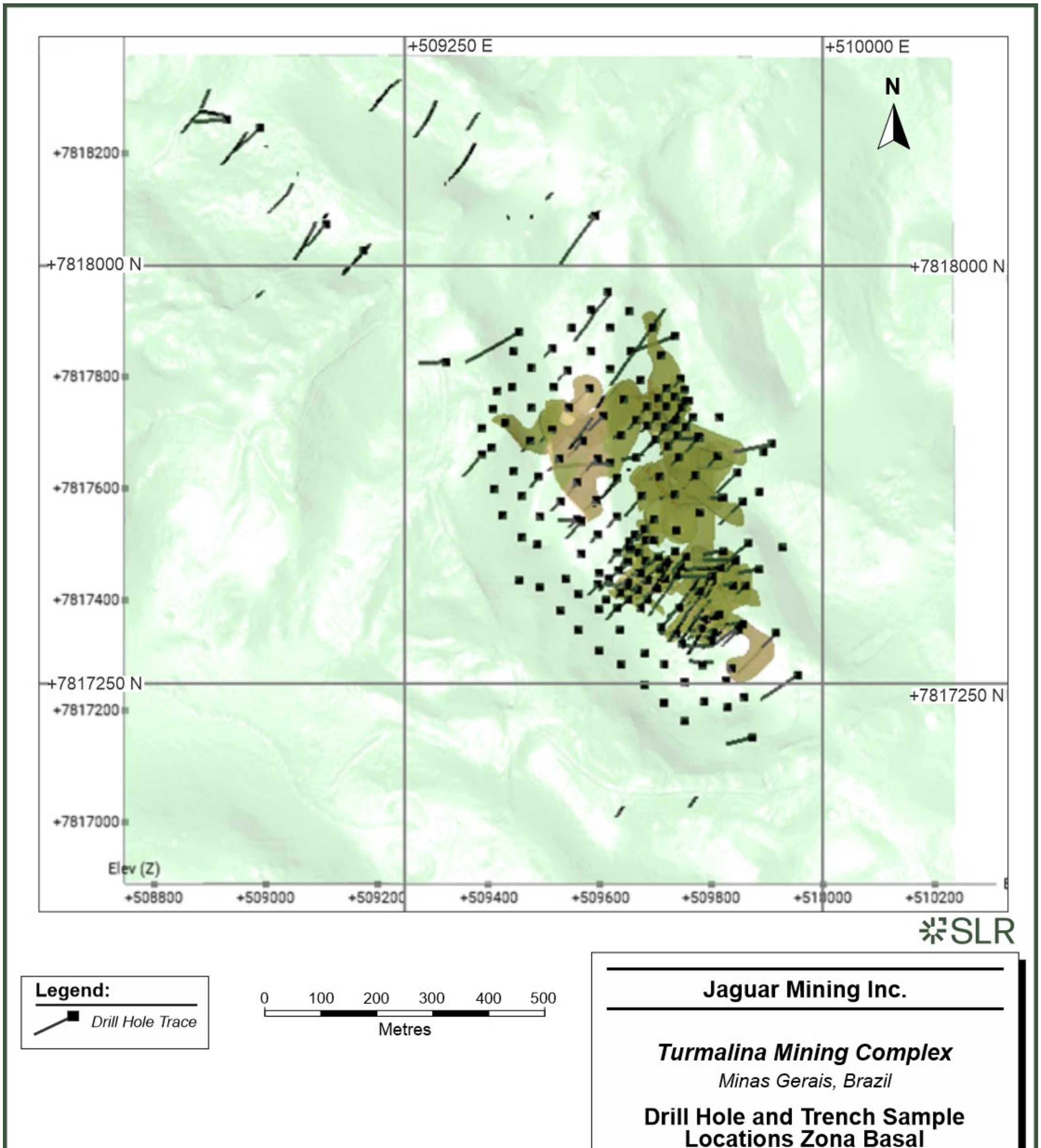
The cut-off date for the drill hole database is August 25, 2022. The drilling and sampling data was carried out using the SIRGAS 2000 grid coordinate system.

A summary of the drilling and trench sampling information used to prepare the current Mineral Resource estimate is provided in Table 14-43. The location of these drill holes and trench samples is presented in Table 14-43. Figure 14-33 provides the Zona Basal drill hole and trench sample locations relative to the mineralized wireframes.

Table 14-43: Description of the Zona Basal Drill Hole Database as of August 25, 2022

Table Name	Records	Length (m)
Collar	424, including: Diamond drill holes: 38 RC: 154 Trench: 232	16,903.6, including: Diamond drill holes: 4,688.5 RC: 8523 Trench: 3,692.1
survey	5,686	
assay raw	16,081	16,808.2
geology	4,756	15,179.6
weather	3,047	16,887.7
composites	16,970	16,903.6

Figure 14-33: Drill Hole and Trench Sample Locations, Zona Basal Deposit



Source: SLR, 2023.

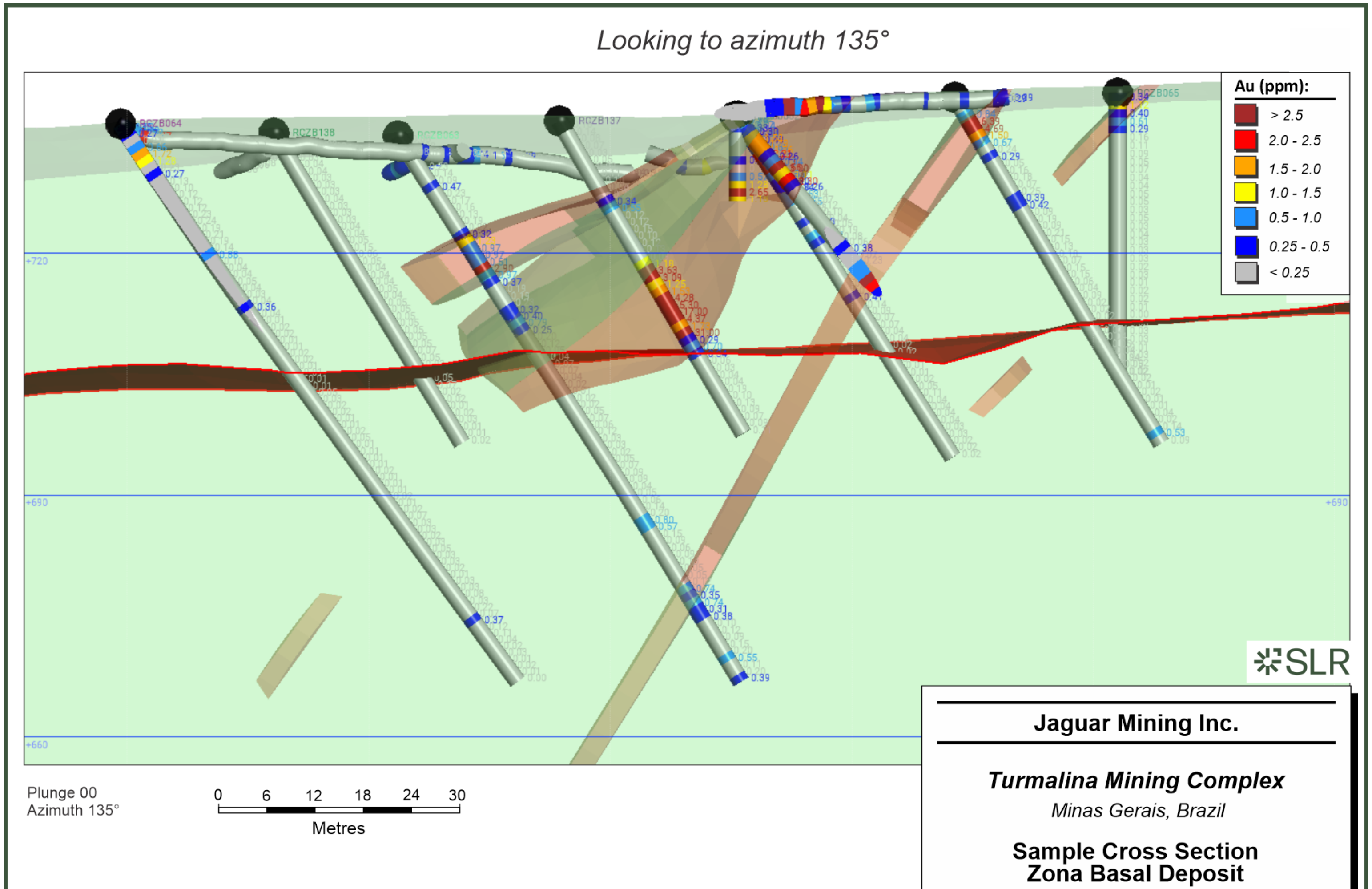
14.5.2 Geological Interpretation

Interpretation of the drill hole and trench sample information began with the construction of a weathering model in which volumes were created for the oxidized and fresh portions of the lithology profile using the Seequent Leapfrog software package. Generally, the depth of the weathering profile extends to depths of 25 m to 35 m in the Zona Basal deposit area.

Three dimensional interpretations of the gold mineralization encountered at the Zona Basal deposit were then created using the assay values from all drill hole samples and trench samples using the Seequent Leapfrog software package. The mineralization wireframes were constructed using a nominal modelling threshold of 0.5 g/t Au and a nominal minimum width of two metres. Some samples containing gold grades less than the stated modelling threshold were included inside the wireframes to preserve the continuity of the interpretation. The wireframe models are located in both the weathered and fresh portions of the lithology profile and were clipped to the topography surface. A total of 26 mineralized wireframes were created for the Zona Basal deposit.

A sample cross section of the drill holes, trench samples, weathering surface and mineralization wireframes is presented in Figure 14-34.

Figure 14-34: Sample Cross Section, Zona Basal Deposit



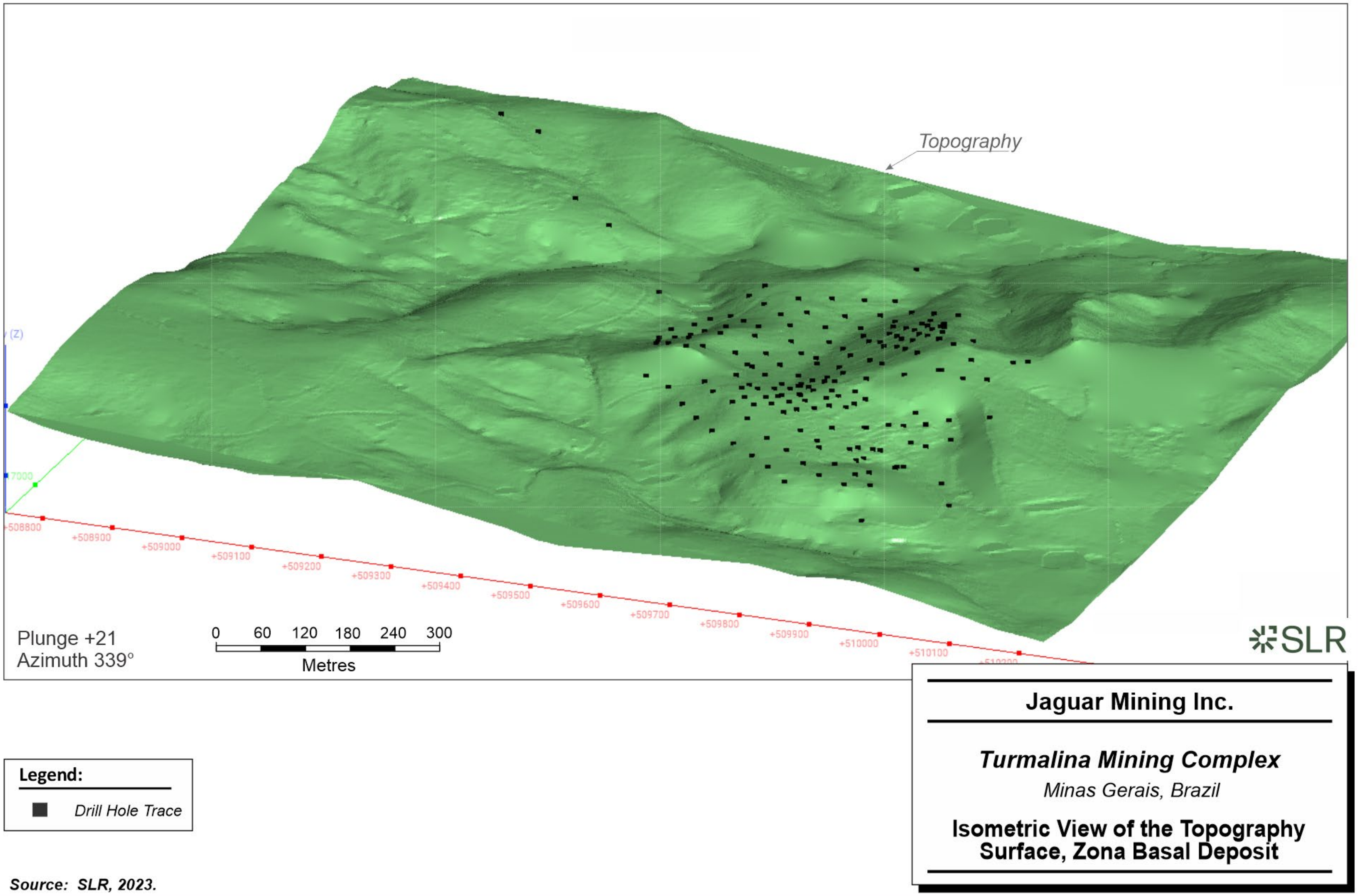
Source: SLR, 2023.

14.5.3 Topography and Excavation Models

The topographic surveys used for previous Mineral Resource estimates at Zona Basal were developed from elevation information contained within existing contour maps. Higher resolution topographic data using a Real-Time Kinematic (RTK) positioning system were more recently acquired by Jaguar by an aerial survey and have superseded earlier topographic survey data.

An isometric view of the resulting digital topographic surface is presented in Figure 14-35.

Figure 14-35: Isometric View of the Topography Surface, Zona Basal Deposit



Source: SLR, 2023.

14.5.4 Resource Assays and Capping

The mineralization wireframe models were used to code the drill hole database and identify the resource related samples. These samples were extracted from the database and then subjected to statistical analyses by means of histograms. A combined total of 1,209 samples were contained within the mineralized wireframes. The sample statistics are summarized in Table 14-44.

Based on their review of the assay statistics, the SLR QP is of the opinion that a capping value of 20 g/t Au is appropriate for the combined mineralized wireframes comprising the Zona Basal deposit. This capping value has been applied to all gold assays prior to compositing.

Table 14-44: Descriptive Statistics of the Uncapped and Capped Gold Assays, Zona Basal Deposit

Item	Raw Assays (g/t Au)	
Statistics	Uncapped	Capped
Count	1,209	1,209
Average (g/t Au)	1.37	1.28
Minimum (g/t Au)	0.00	0.00
Maximum (g/t Au)	34.60	18.40
Standard Deviation (g/t Au)	2.04	1.37
CV	1.49	1.07

14.5.5 Compositing

The selection of an appropriate composite length began with examination of the descriptive statistics of the raw assay samples and preparation of sample length frequency histograms. Consideration was also given to the size of the blocks in the model. The SLR QP is of the opinion that a composite length of one metre for all samples is reasonable. All capped samples contained within the mineralized wireframes were composited to a nominal one metre length using the best-fit function of the Seequent Leapfrog software package. The composite descriptive statistics are provided in Table 14-45.

Table 14-45: Descriptive Statistics of the Capped Composite Samples, Zona Basal Deposit

Item	Composites (g/t Au)
Statistics	Capped
Count	1,247
Average (g/t Au)	1.27
Minimum (g/t Au)	0.00
Maximum (g/t Au)	18.40
Standard Deviation (g/t Au)	1.34
CV (g/t Au)	1.05

14.5.6 Bulk Density

Jaguar carried out a program of systematic collection of the bulk densities of the various materials encountered at the Zona Basal deposit using samples collected from drill holes. The bulk density values were determined by the water displacement method on selected pieces of drill core by Jaguar's laboratory staff at the Caeté site. A total of 403 ore and waste bulk density samples have been collected at Zona Basal (Table 14-46).

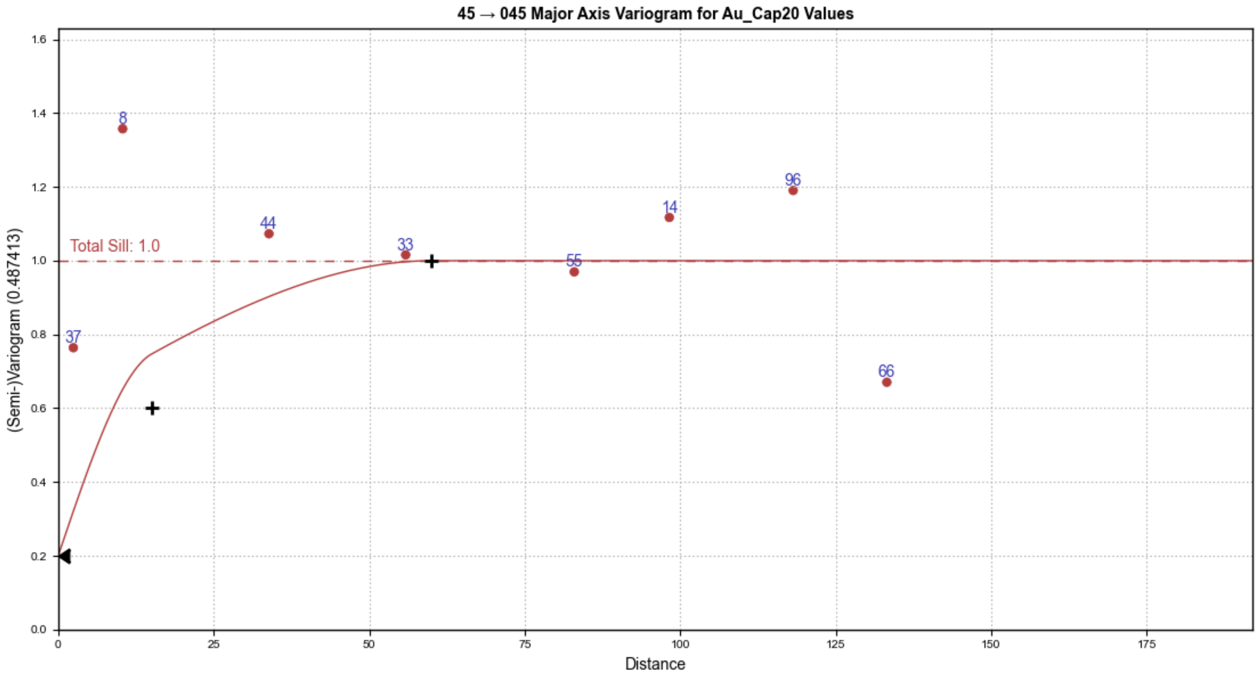
Table 14-46: Summary of Bulk Density Measurements, Zona Basal Deposit

Material Type	No. of Samples	Average Bulk Density (g/cm^3)
Oxide	118	1.57
Transitional	29	2.56
Fresh	256	2.86

14.5.7 Variography

Figure 14-36 shows the analysis of the spatial continuity of the capped, composited gold grades contained within the mineralized wireframe models of the Zona Basal deposit. A summary of the variogram parameters is presented in Table 14-47.

Figure 14-36: Major and Semi-Major Axis Variograms, Zona Basal Deposit



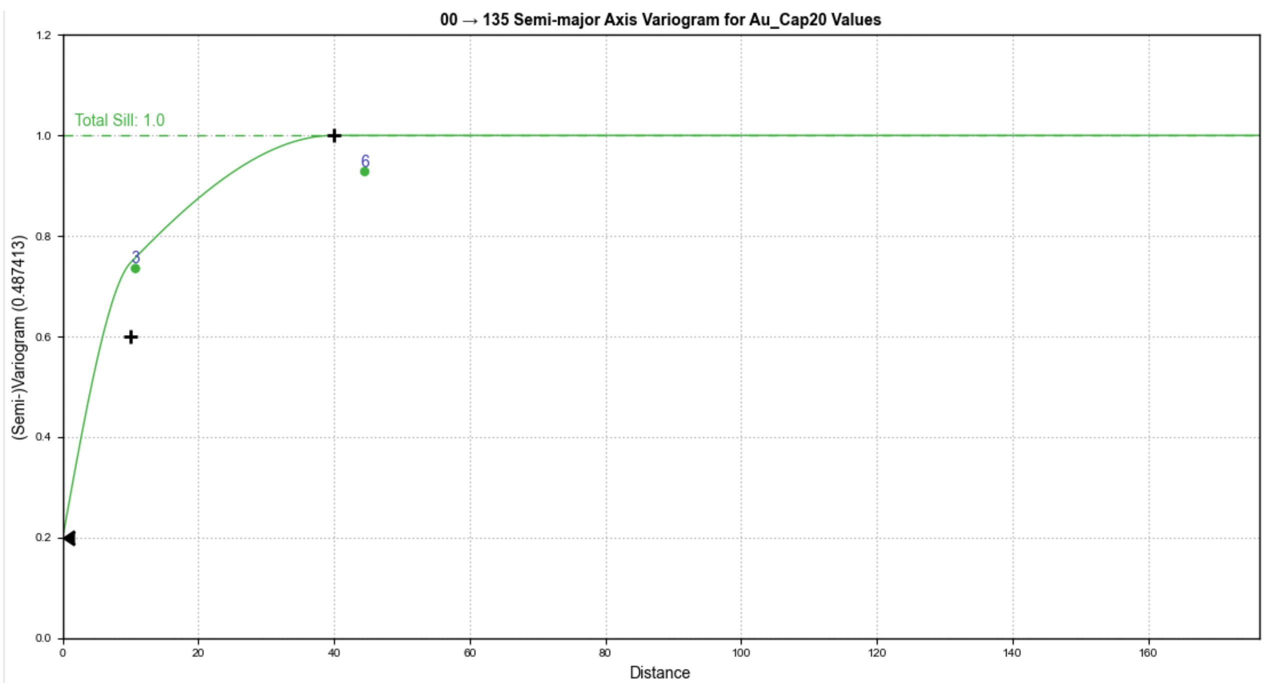


Table 14-47: Summary of Variogram Parameters, Zona Basal Deposit

Item	Value
Variogram Model	Normalized Sill
Nugget (C0)	0.20
Sill Major Axis (C1)	0.40
Sill Major Axis (C2)	0.40
Model Type	Spherical
Orientation (Dip/Dip Az/Pitch)*	045/045/90
Structure1 Major (m)	15
Structure1 Semi-Major (m)	10
Structure1 Minor (m)	5
Structure2 Major (m)	60
Structure2 Semi-Major (m)	40
Structure2 Minor (m)	20

Note.* Variogram orientation notation uses the Leapfrog software convention

14.5.8 Block Model Construction

The block model was constructed using the Seequent Leapfrog software package and comprised an array of 4 m x 4 m x 4 m sized parent blocks, sub-blocked to a minimum block size of 0.5 m x 0.5 m x 0.5 m. The model is oriented parallel to the coordinate grid system (i.e., no rotation or tilt). The block model origin, dimensions, and attribute list are provided in Table 14-48.

Attributes were created to store information such as rock code, material densities, estimated gold grades, mineral resource classification, and mined out material (Table 14-49).

Table 14-48: Block Model Definition, Zona Basal Deposit

Type	Northing (Y)	Easting (X)	Elevation (Z)
Minimum Coordinates (m)	508,800	7,817,100	802
Maximum Coordinates (m)	510,100	7,818,300	1,154
User Block Size (m)	4	4	4
Min. Block Size (m)	0.5	0.5	0.5
Rotation (°)	0.000	0.000	0.000

Table 14-49: List of Block Model Attributes, Zona Basal Deposit

Variable Name	Description
auokc	Gold by Ordinary Kriging
class	Initial classification

Variable Name	Description
dens	Material Density
rclass	Mineral Resource Classification (1=measured, 2=indicated, 3=inferred)
rock	Wireframe ID
topo%	Percent of Block Below Topography Surface
Weath	Weathering code (Ox or Fr)

14.5.9 Search Strategy and Grade Interpolation Parameters

Gold grades were estimated into the blocks using the OK interpolation algorithm. A total of three interpolation passes at different ranges were carried out using distances derived from the variography results and the search ellipse parameters presented above. The orientations of the search ellipses were varied for each of the mineralized wireframes using the dynamic anisotropy function of the Seequent Leapfrog software package so as to provide a better alignment with the spatial orientations of the individual mineralized wireframes.

In general, “hard” domain boundaries were used along the contacts of the mineralized domain models for all of the mineralized lenses. Only data contained within the respective wireframe model were allowed to be used to estimate the grades of the blocks within the wireframe in question, and only those blocks within the wireframe limits were allowed to receive grade estimates. The block grades were estimated using the parameters presented in Table 14-50.

Table 14-50: Summary of Kriging Grade Estimation Parameters, Zona Basal Deposit

Parameters	Pass 1	Pass 2	Pass 3
Search Definition	Ellipsoid	Ellipsoid	Ellipsoid
Variable Orientation	Dynamic	Dynamic	Dynamic
Minimum No. of Composites	8	5	1
Maximum No. of Composites	12	12	8
Maximum No. Composites per Drill Hole	4	4	4
Maximum No. Empty Sectors	2	2	N/A
Discretization	3x3x3	3x3x3	3x3x3
Major Ellipse Dimension (m)	30	60	240
Semi-Major Ellipse Dimension (m)	20	40	160
Minor Ellipse Dimension (m)	10	20	80

14.5.10 Block Model Validation

Validation of the estimated block model grades included a comparison of the average of all estimated block grades to the average of the composites (Table 14-13). In consideration of such items as the volume-variance effect, projection of estimated grades beyond the limits of the drill hole information and the effect of clustered data, the average estimated block grades agree reasonably well with the average grades of the informing composites.

Table 14-51: Assay vs Composite vs Block Model Zona Basal Deposit

Item	Raw Assays (g/t Au)	Composites (g/t Au)		Block Grades (g/t Au)	
Statistics	Uncapped	Capped	Capped	Nearest Neighbour (NN)	Ordinary Kriging (OK)
Count	1,209	1,209	1,247	754,957	754,957
Average	1.37	1.28	1.27	1.05	1.15
Minimum	0.00	0.00	0.00	0.00	0.00
Maximum	34.60	18.40	18.40	8.61	10.16
Sd	2.04	1.37	1.34	0.90	0.67
CV	1.49	1.07	1.05	0.86	0.59

14.5.10.1 Local Estimate

A series of swath plots were prepared in which the average grade of the channel and drill hole composites and the block grades were compared by elevation (Figure 14-37 and Figure 14-38,). For the swath plots, OK block grades are shown in orange, the NN block grades are shown in blue and the capped composites are shown in black.

There is typically a strong agreement between the estimated OK block grades and the NN block grades. As would be expected, capped composite grades show more variability locally compared to the OK and NN block grades particularly at depth where data density is low.

Figure 14-37: Swath Plot by Easting, Zona Basal Deposit (12 m bin width)

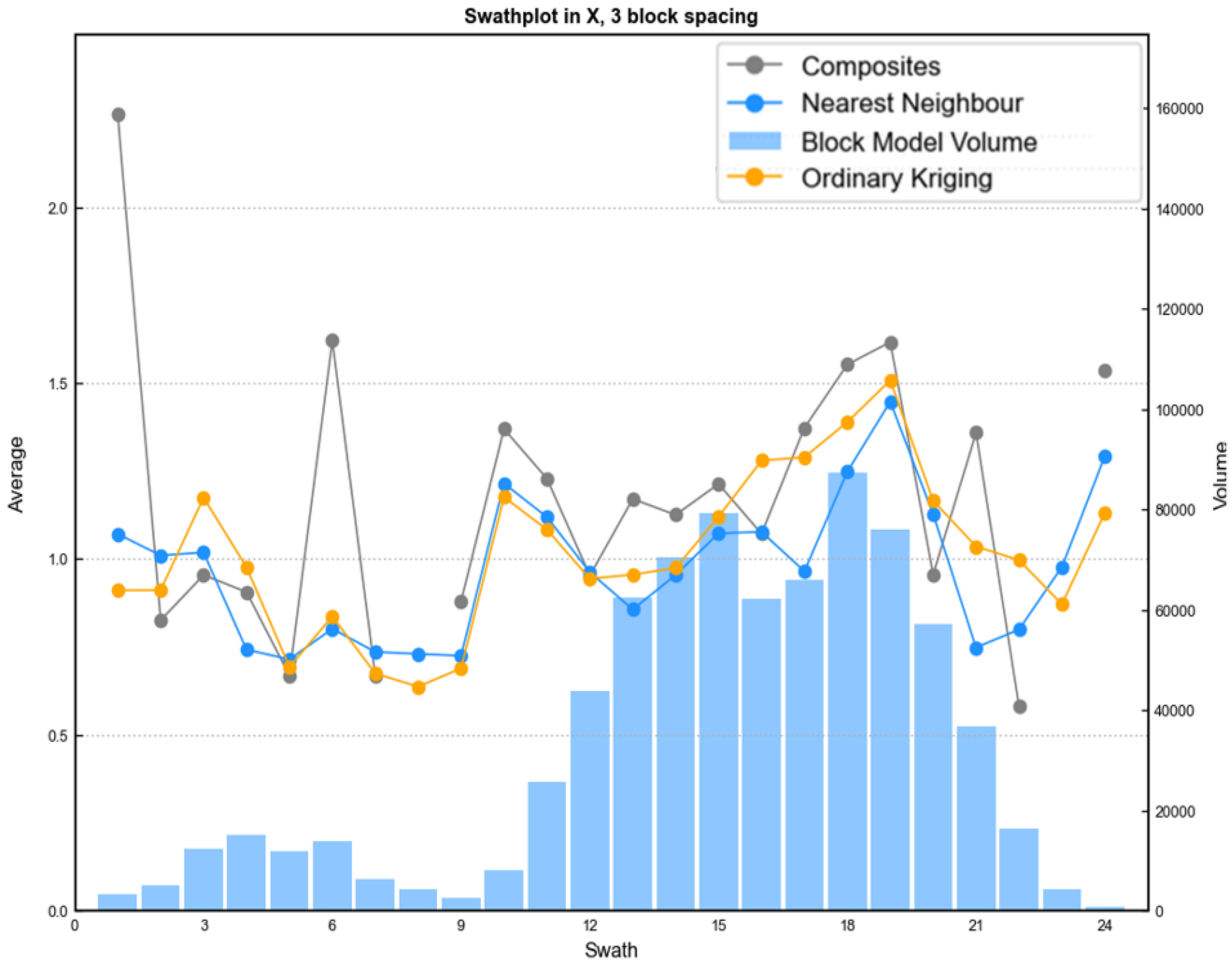


Figure 14-38: Swath Plot by Northing, Zona Basal Deposit (12 m bin width)

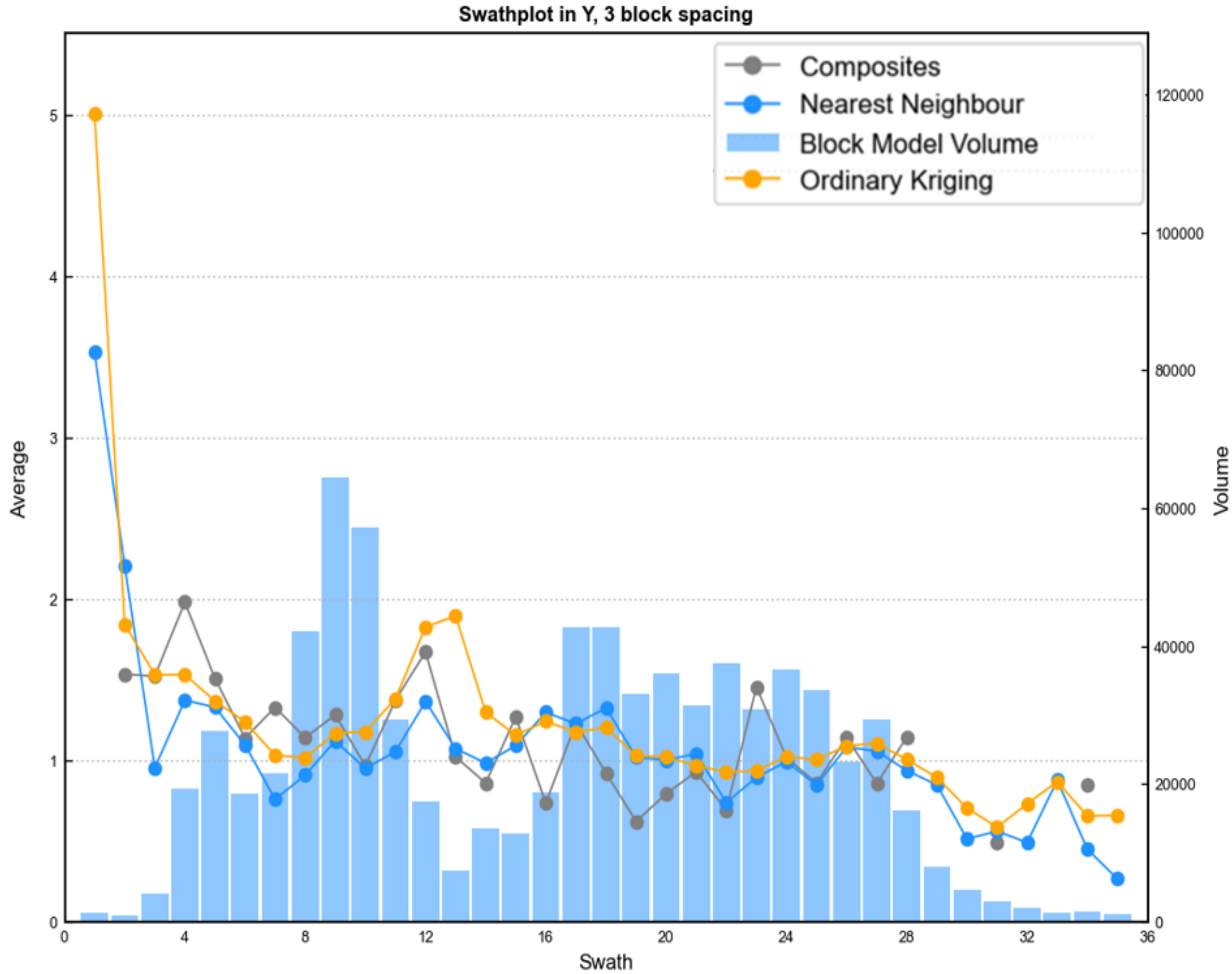
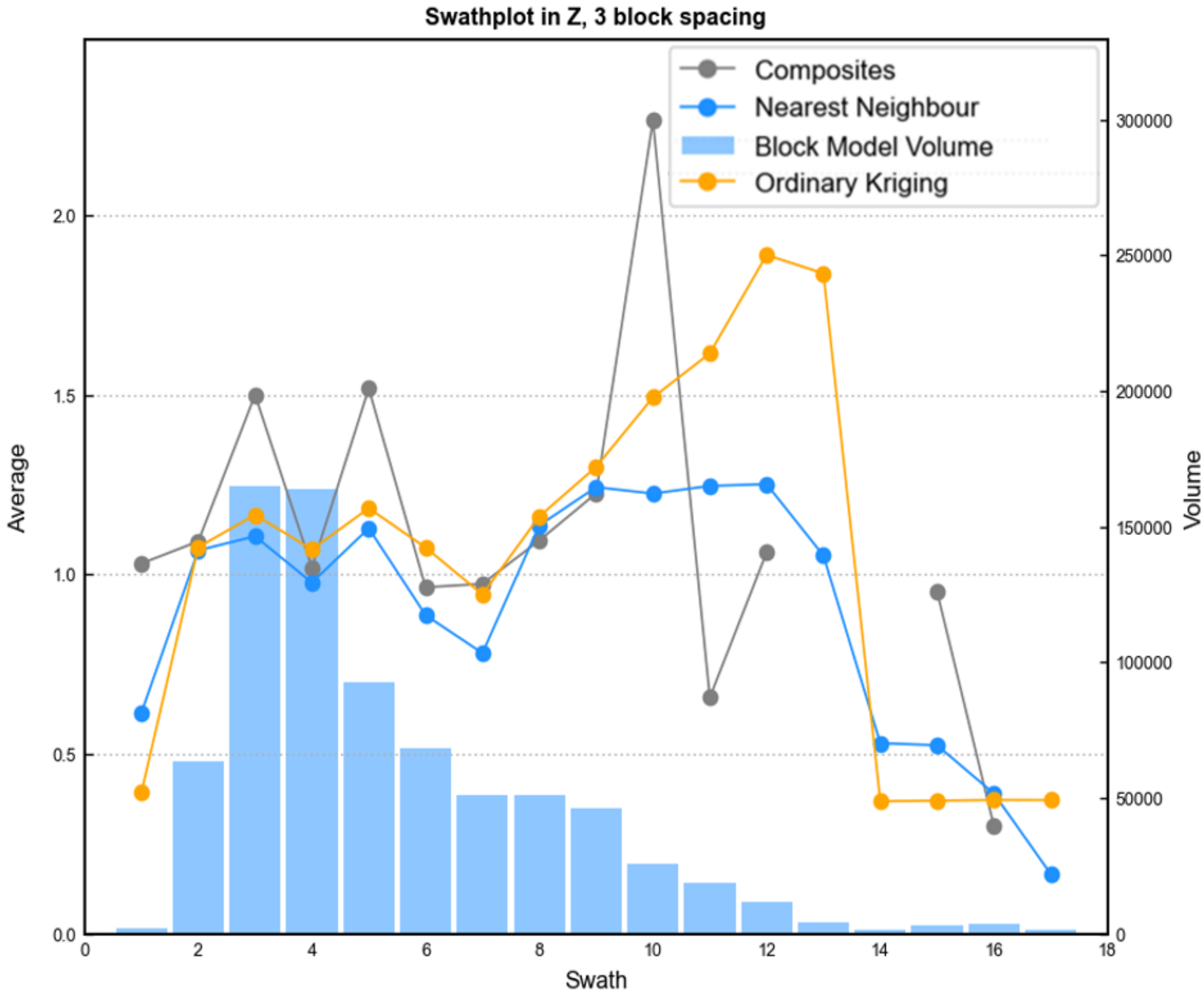


Figure 14-39: Swath Plot by Elevation, Zona Basal Deposit (12 m bin width)



Evaluation of the accuracy of the local estimate was also carried out by visually comparing the contoured gold grades against the estimated block grades in longitudinal views.

14.5.11 Mineral Resource Classification

All material contained within the mineralized wireframe domains at the Zona Basal deposit were classified into the Inferred Mineral Resource category.

14.5.12 Cut-off Grade and Whittle Parameters

A cut-off grade of 0.75 g/t Au was derived for reporting of the Mineral Resources at the Zona Basal deposit. The cut-off grade was calculated using a gold price of US$1,800/oz, an exchange rate of BRL5.00:US$1.00, average gold recovery of 93%, and forecast operating costs based on performance data from the Turmalina Mine and estimates (Table 14-52). Gold prices are based on consensus, long term forecasts from banks, financial institutions, and other sources.

An open pit shell was created using cut off grade parameters and technical parameters as shown in Table 14-53. The resulting pit shell was then used as a constraint for preparing the Mineral Resource statement.

Table 14-52: Summary of Cut-off Grade Parameters, Zona Basal Deposit

Item	Units	Value	Remarks
Mining Cost, Ore	US$/t	2.50	Estimate
Mining Cost, Waste	US$/t	2.50	Estimate
Processing Cost	US$/t	27.04	Actual Turmalina Plant cost
Haulage Cost (~6 km)	US$/t	1.07	Based on actual hauling costs from Jaguar's Pilar Mine to the Turmalina Plant
G&A	US$/t	0.85	Accounting Turmalina Plant
Total	**US$/t**	**33.95**	

Table 14-53: Summary of Open Pit Technical Parameters, Zona Basal Deposit

Parameter	Units	Value
Bench Height	m	6.0
Berm Width	m	3.0
Bench Face Angle, Oxide	degrees	45
Bench Face Angle, Fresh	degrees	65
Overall Slope Angle, Oxide	degrees	27.6
Overall Slope Angle, Fesh	degrees	40.5

14.5.13 Mineral Resource Estimate

The Mineral Resources are inclusive of Mineral Reserves. The Mineral Resources are presented in Table 14-54 and are illustrated in Figure 14-40. Mineral Resources were reported as all blocks contained within a constraining open pit surface that are above the nominated cut-off grade.

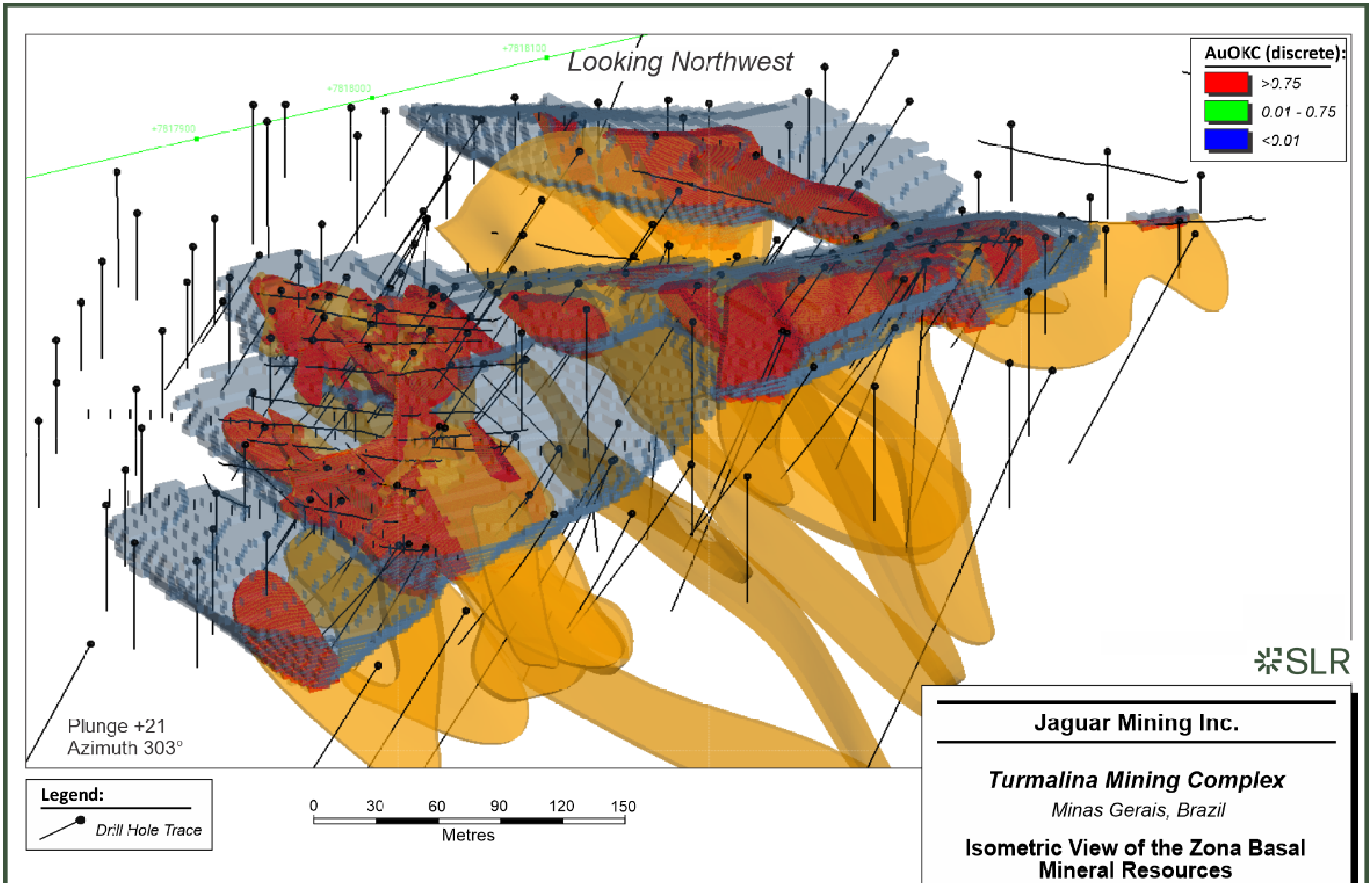
Table 14-54: Summary of Mineral Resources as of December 31, 2022, Zona Basal Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Inferred	781	1.28	32

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a cut-off grade of 0.75 g/t Au.
4. The effective date of the Mineral Resource estimate is December 31, 2022. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au.
5. Mineral Resources are estimated using an average long term foreign exchange rate of R$5.20 : US$1.00.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated by the OK interpolation algorithm using capped composite samples.
8. Mineral Resources are reported as all blocks above the nominated cut-off grade located within an optimized open pit shell.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not sum due to rounding.

Figure 14-40: Isometric View of the Zona Basal Mineral Resources



Source: SLR, 2023.

14.5.14 Factors Affecting the Mineral Resource

Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. At the present time, the SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues that may have a material impact on the Zona Basal deposit Mineral Resource estimate other than those discussed below.

Factors that may affect the Zona Basal deposit Mineral Resource estimates include:

- Metal price and exchange rate assumptions,
- Changes to the assumptions used to generate the cut-off grade used for construction of the mineralized wireframe domains,
- Changes to geological and mineralization shape and geological and grade continuity assumptions and interpretations,
- Due to the natural variability inherent with gold mineralization in mesothermal gold deposits, the presence, location, size, shape, and grade of the actual mineralization located between the existing sample points may differ from the current interpretation. The level of uncertainty in these items is lowest for the Measured Mineral Resource category and is highest for the Inferred Mineral Resource category,
- Changes to the understanding of the current geological and mineralization shapes and geological and grade continuity resulting from acquisition of additional geological and assay information from future drilling or sampling programs,
- Changes in the treatment of high grade gold values,
- Changes due to the assignment of density values, and
- Changes to the input and design parameter assumptions that pertain to the assumptions for creation of underground constraining volumes.

14.5.15 Comparison with Previous Mineral Resource Estimate

As the current Mineral Resources are the initial estimate resulting from the recent discovery made by Jaguar's exploration team as a result of trenching and drilling programs carried out in 2020 and 2021, no previous Mineral Resource estimates exist for this deposit.

14.6 São Sebastião Deposit

14.6.1 Resource Database

The following description is excerpted from SRK (2021).

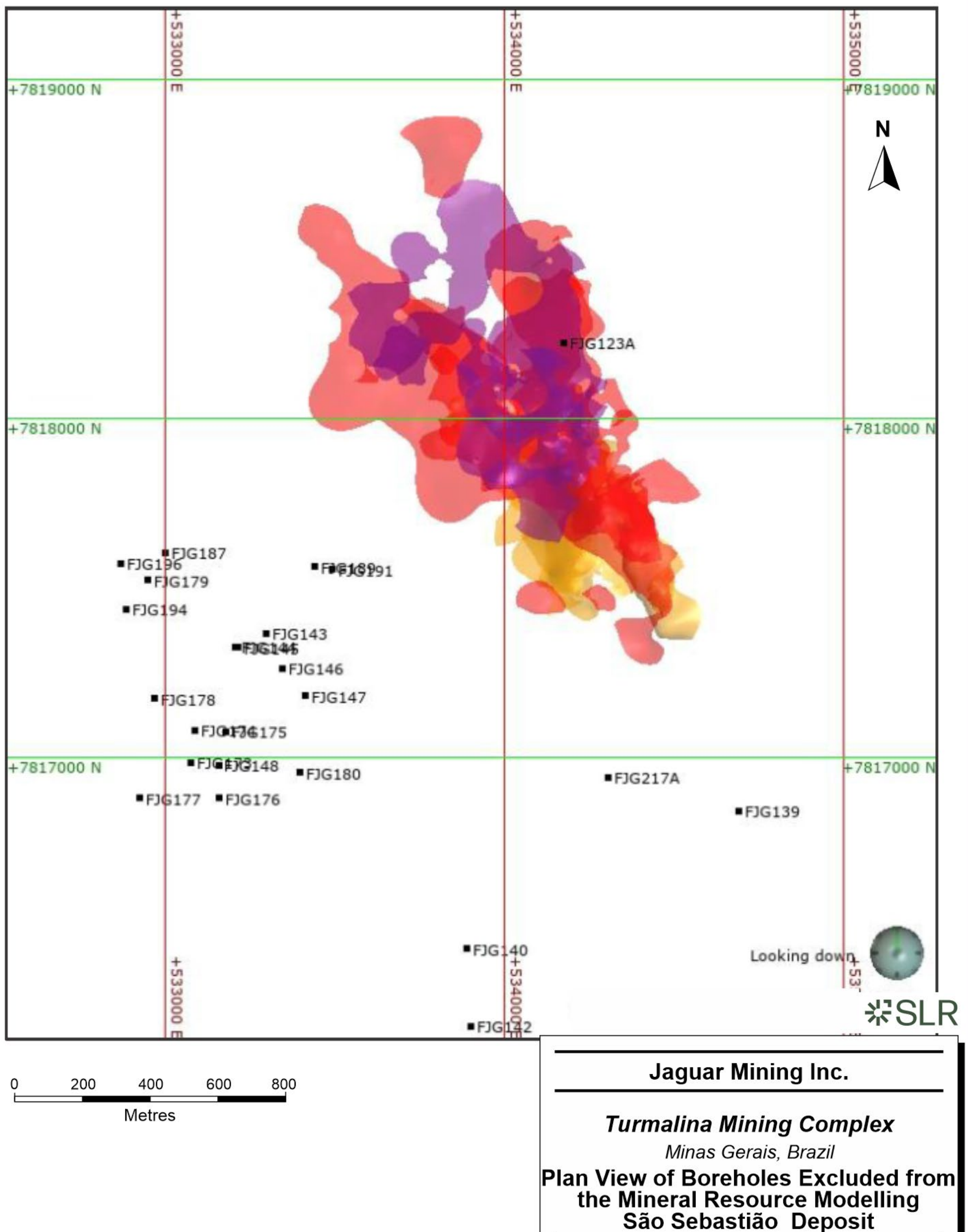
"The resource database comprises samples from core boreholes drilled from surface. IAMGOLD provided the resource database together with the Leapfrog project used by the IAMGOLD project team to develop the geological interpretation. The header, down-hole survey, lithology intervals, and assay results were received on July 29, 2019. SRK was provided with a database comprising 240 boreholes (88,034 m). After discussion with IAMGOLD, SRK excluded 24 boreholes from the database due to the following reasons:

- FJG123A and FJG217A – twin drilling, only the data from the original boreholes were used.

- FJG139, FJG140 and FJG42 – drilled on geophysics anomalies in the lower meta-ultramafic unit out of the current resource area.
- FJG143 to FJG148 (6), FJG173 to FJG180 (8), and FJG189, FJG191, FJG194, FJG196 (5) – drilled out of the resource area.

The locations of the excluded boreholes against the resource domains are presented in Figure 14-41.

Figure 14-41: Plan View of Boreholes Excluded from the Mineral Resource Modelling, São Sebastião Deposit



Source: SRK, 2021.

The final database used for the resource modelling comprises 216 (80,041 m) boreholes drilled by IAMGOLD and includes 332,724 samples assayed for gold and 30,505 specific gravity samples. SRK received the sampling data imported in Leapfrog Geo software and performed the following validation steps:

- Checked for the absence of collar, survey, and interval table information for all boreholes.
- Checked for minimum and maximum values for each quantity value field.
- Checked for gaps, overlaps, and out of sequence intervals for both assays and lithology tables.
- Checked the absent values in assay information (all unsampled intervals were treated as zeros).

All borehole collars were surveyed according to UTM coordinates (Corrego_Alegre_UTM Zone 23S). IAMGOLD also transferred to SRK a high-resolution topographic surface as part of the Leapfrog project used for geological modelling."

14.6.2 Geological Interpretation

A description of the domain modelling is excerpted from SRK (2021) as follows:

"The style of iron formation-hosted gold mineralization in the São Sebastião deposit suggests strong geological controls are appropriate for development of resource domains. Continuous zones of gold mineralization are assumed to be primarily spatially associated with the replacement of magnetite within the banded iron formation (BIF), whereas the presence of the mineralized samples outside BIF in the host rocks represent disseminated mineralization associated primarily with gold remobilization processes. The geological / domain modelling included two stages:

1 Geological modelling of the lithology units

2 Developing of the mineralized zones within BIF lithology

14.6.2.1 Lithology

The lithology model for the São Sebastião deposit includes four main geological units:

1 BIF domains that are split into three stratigraphic levels (from top to bottom):

   a) Tomate

   b) Biquinho

   c) Pimentão

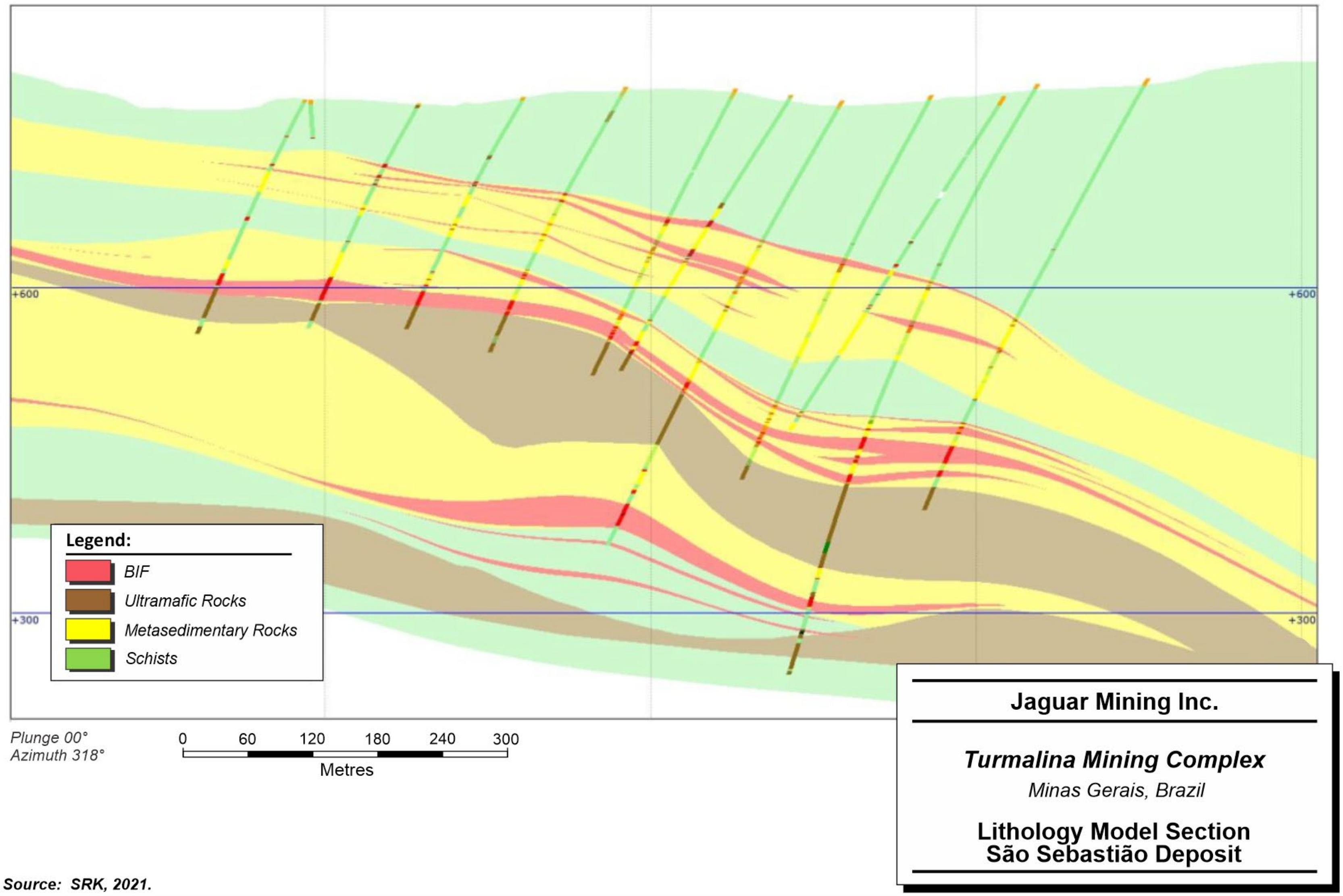
2 Ultramafic rocks

3 Metasedimentary rocks

4 Schists

The lithology model was developed by IAMGOLD and reviewed by SRK against the existing lithology information and sectional interpretation. In SRL's opinion, the quality of the existing lithology model is good and can be used for resource modelling purposes. A representative section of the lithology model is presented in Figure 14-42.

Figure 14-42: Lithology Model Section, São Sebastião Deposit

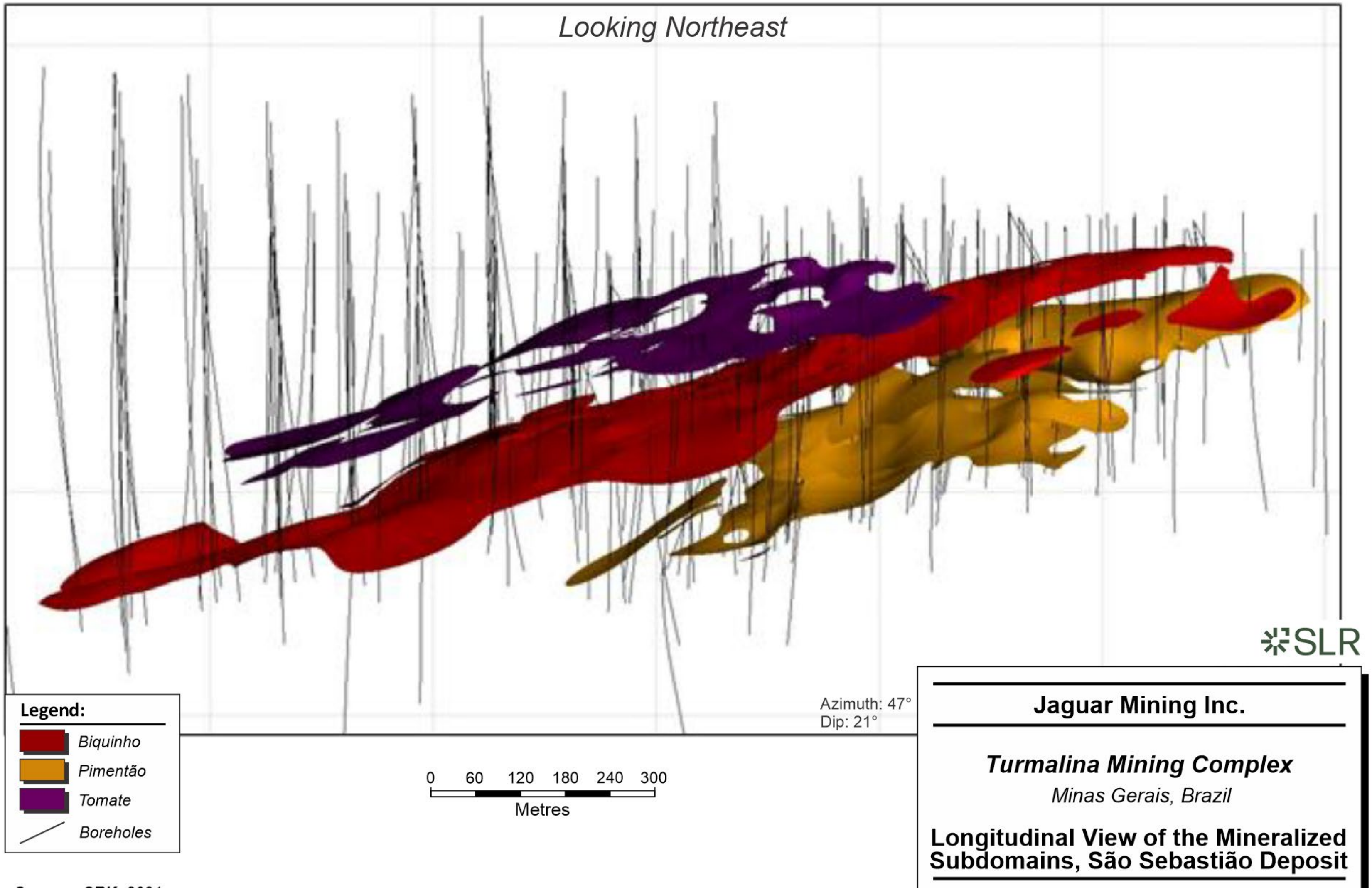


Source: SRK, 2021.

14.6.2.2 Mineralization Zones

The mineralization zones within the BIF units were developed using a grade threshold of 0.1 g/t Au with maximum of tow metre interval waste inclusion allowance. SRK used the original IAMGOLD interpretation as the reference for the modelling of 21 mineralized subdomains: 7 for Biquinho, 11 for Pimentão, and 4 for Tomate zones. The mineralized subdomains were developed as continuous zones of gold mineralization constrained within different stratigraphic levels of the BIF units and are consistent with the overall geometry of their respective BIF units. A longitudinal view of the mineralized zones is presented in Figure 14-43.

Figure 14-43: Longitudinal View of the Mineralized Subdomains, São Sebastião Deposit

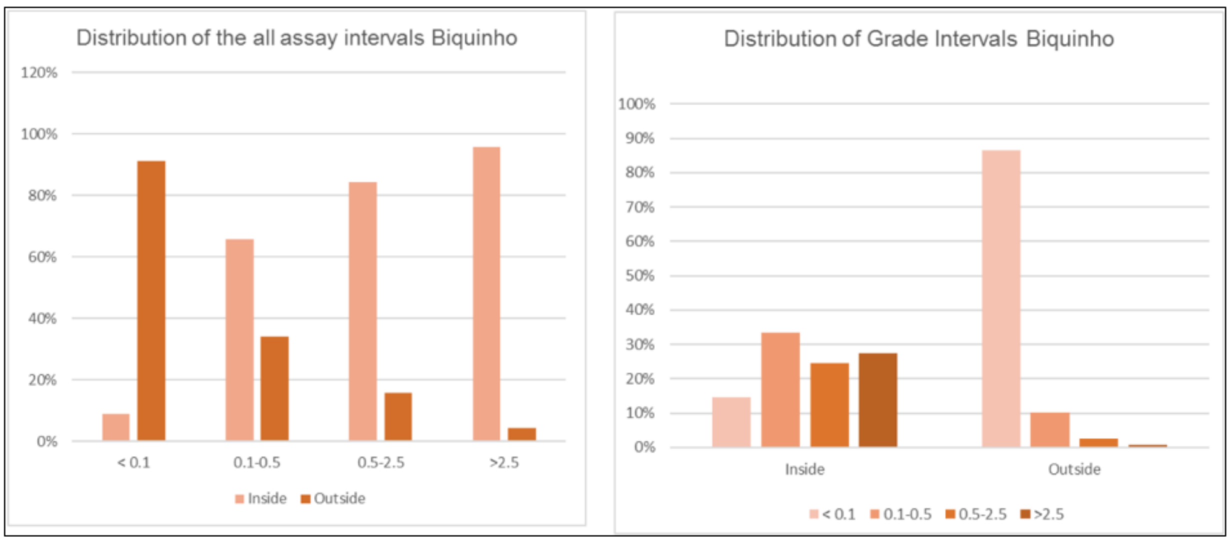


Source: SRK, 2021.

To assess the quality of the subdomains within the BIF units, SRK coded the assay intervals into groups based on the grade and their location inside/outside of the mineralized zones and analyzed the length distribution of the intervals constrained in the BIF units. The results of this comparison for the Biquinho zone are presented in Figure 14-44 . The left-side graphs shows that the over 90% of the intervals less than 0.1 g/t Au reside outside of the mineralized zones within the Biquinho BIF, while the right-side plot shows that 85% of the intervals inside the mineralized zones are greater than or equal to 0.1 g/t Au. This analysis confirms that the majority of the mineralized intervals are constrained within subdomains.

SRK coded and grouped domains for estimation purposes. The coding system of the domains is presented in Table 14-55 below. The BIIF units were split into mineralized and non-mineralized zones whereas other lithology units were not changed and were used directly in resource estimation. For the purpose of statistical and geostatistical analyses, all mineralized subdomains within Biquinho, Pimentão, and Tomate zones were grouped into 199, 299, and 399 domains, respectively. All BIF unmineralized domains were grouped into the 1000 domain."

Figure 14-44: Length Distribution of the Coded Assays within Biquinho Zone



Source: SRK (2021).

Table 14-55: Domains Summary, São Sebastião Deposit

Lithology	Zone	Mineralization	Codes	Original IAMGOLD Interpretation	Groups for Data Processing	Mineralized Volume (%)	Azimuth/Dip of the Zone
BIF	Biquinho	Host	100		1000		350/20
		Mineralized	101	B01	199	48	
			102	B02		10	
			151	B07		1	
			152	B04 and B14		4	
			153	B04 and B11		0	
			154	B06 and B17		0	

Lithology	Zone	Mineralization	Codes	Original IAMGOLD Interpretation	Groups for Data Processing	Mineralized Volume (%)	Azimuth/Dip of the Zone
			161	B08 and B09		1	
	Pimentão	Host	200		1000		
		Mineralized	201	P08	299	1	325/20 Variable
			202	P07		1	
			203	P04		6	
			204	P02		5	
			205	P03 and P13		2	
			206	P05		3	
			207	P06		0	
			208	P01 and P12		1	
			209	P09		0	
			210	P10		5	
			211	P11		0	
	Tomate	Host	300		1000		
		Mineralized	301	T03	399	6	350/25
			302	T01		5	
			303	T02		1	
			304	T04		0	
Ultramafic		Host	400		400		
Metasediments			500		500		
Schists			600		600		

While the mineralization wireframes are suitable for the purposes of Resource estimation, SLR recommends that Pitangui mineralization wireframes should be revised to eliminate the use of 'pinch outs' and reduce the number of isolated wireframes with a single mineralized intercept. Additional efforts should be made to integrate the reference surfaces that control the lithological model wireframes with the mineralization wireframes to avoid clipping artifacts.

14.6.3 Compositing

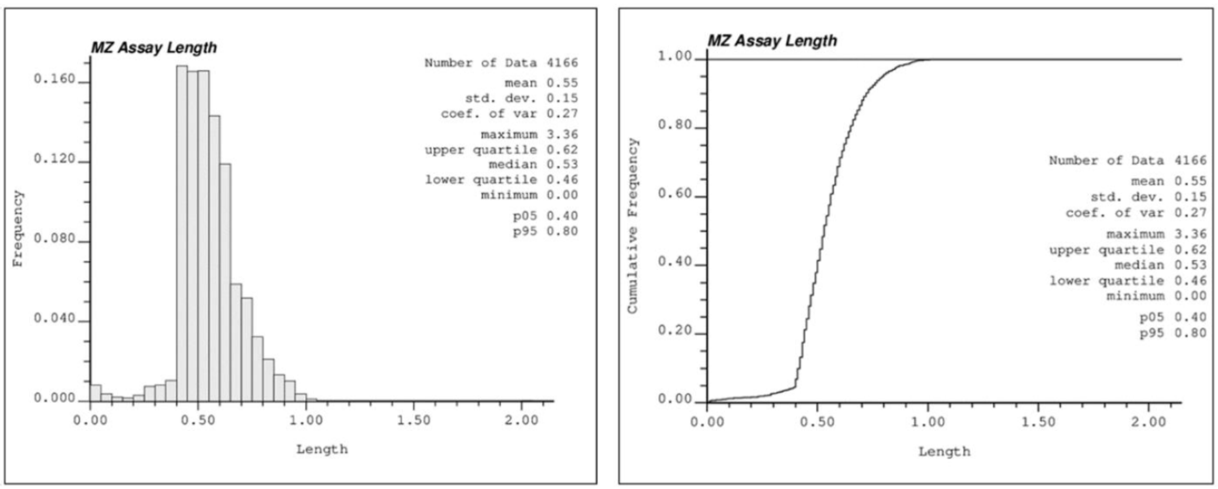
A description of the compositing function carried out is excerpted from SRK (2021) as follows:

“The distribution of assay lengths within the mineralized subdomains is shown in Figure 14-45. Virtually all assays are samples at less than one-metre intervals. SRK chose to composite at one metre to avoid “breaking” assays to form smaller composites. This composite length also considered the potential block size to be estimated as well as the thickness of the mineralized BIF zones.

Residual length composites were evaluated to determine if they should remain in the database. The general concern is that shorter composite intervals may be associated with higher grades, and the direct use of these composites in Mineral Resource estimation may lead to overestimation. This is particularly concerning if the length of the composites is not used as a weight in the estimation; as most general mine planning packages do not allow the use of weighting composite grades by length, this may be a risk in implementation.

SRK reviewed the impact of residual composites by comparing the length-weighted average of assay intervals against the unweighted average of composite grades when residual composites shorter than 50% (0.50 metres) of the composite length were removed from the database on a by-domain basis. Although sparsely informed domains showed a significant change in the mean, the overall impact to the mean grade was less than 1% due to the removal of shorter length composites for all mineralized subdomains. Thus, SRK chose to exclude composites shorter than 50% of the composite length (or 0.50 m) in subsequent data analysis and block grade estimation. In all cases, composite files were derived from raw assay values within the modelled resource domains."

Figure 14-45: Assay Lengths for Mineralized Subdomains



Source: SRK (2021).

14.6.4 Treatment of High Grade Assays

The evaluation of outliers was described in SRK (2021) as follows:

"To further limit the influence of high grade gold outliers during grade estimation, SRK chose to cap composites, as these are the data used explicitly in estimation. Capping was performed for the grouped mineralized subdomains (i.e. 199, 299, and 399) and lithology domains. SRK relied on a combination of probability plots and capping sensitivity plots. Separation of grade populations characterized by inflections in the probability plot or gaps in the high tail of the grade distribution were indicators of potential capping values. SRK used the following capping values for the domains:

- Mineralized domains within:
  - Biquinho (Group 199) – 22 g/t Au
  - Pimentão (Group 299) – 20 g/t Au
  - Tomate (Group 399 – no capping applied

- BIF host rocks (Group 1000) – 3 g/t Au
- Ultramafic rocks (400) – 0.5 g/t Au
- Metasedimentary rocks (500) and schists (600) – 1.5 g/t Au

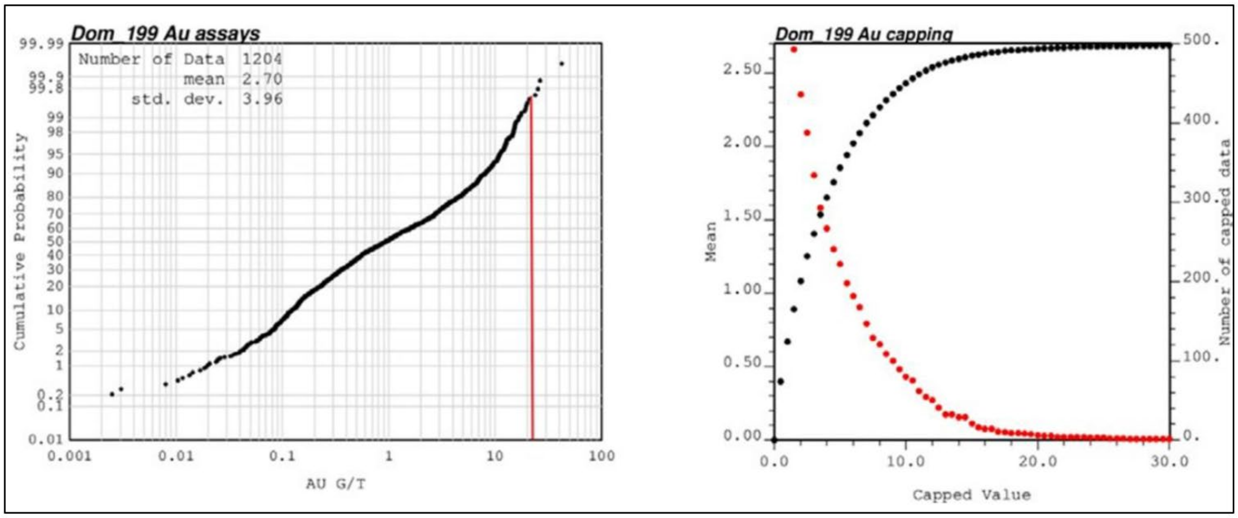
The selected capping values, along with the uncapped and capped composite statistics are provided in Table 14-56. Figure 14-46 shows an example probability plot and capping sensitivity curve for group 199 (Biquinho mineralized zones)."

Table 14-56: Summary Basic Statistics for Raw Sample, Composite, and Capped Composite Data, São Sebastião Deposit

Domain	Original Assays (Length-weighted)							Composites						Capped Composites						Assay Length /	Compositing Impact		Capping Impact		
	Count	Length	Mean	St Dev	CV	Min	Max	Count	Mean	St Dev	CV	Min	Max	Count	Mean	St Dev	CV	Min	Max	Number of Comp	Mean	CV	Comps	Mean	CV
100	3,656	2,078	0.12	0.62	5.35	0.00	19.50	2,070	0.11	0.49	4.35	0.00	11.29	2,070	0.10	0.31	3.08	0.00	3.00	0%	-2%	-19%	0.00%	-12%	-29%
101	1,529	828	3.21	5.16	1.61	0.00	58.50	828	3.22	4.31	1.34	0.00	42.20	828	3.18	4.11	1.29	0.00	22.00	0%	0%	-17%	0.00%	-1%	-4%
102	379	204	1.80	4.31	2.40	0.00	55.60	206	1.83	3.37	1.85	0.02	25.15	206	1.81	3.27	1.81	0.02	22.00	1%	2%	-23%	0.00%	-1%	-2%
151	45	23	0.94	1.34	1.43	0.01	5.96	23	1.05	1.27	1.21	0.05	5.96	23	1.05	1.27	1.21	0.05	5.96	0%	12%	-15%	0.00%	0%	0%
152	197	106	1.36	2.25	1.66	0.00	12.90	105	1.36	1.84	1.36	0.01	12.06	105	1.36	1.84	1.36	0.01	12.06	-1%	0%	-18%	0.00%	0%	0%
153	14	7	2.21	2.48	1.12	0.08	6.74	7	1.99	1.60	0.80	0.36	4.93	7	1.99	1.60	0.80	0.36	4.93	-4%	-10%	-28%	0.00%	0%	0%
154	19	10	1.62	1.79	1.11	0.12	5.86	10	1.44	1.32	0.92	0.21	3.68	10	1.44	1.32	0.92	0.21	3.68	5%	-11%	-17%	0.00%	0%	0%
161	44	26	0.73	1.03	1.42	0.01	3.59	25	0.65	0.76	1.18	0.02	2.83	25	0.65	0.76	1.18	0.02	2.83	-2%	-11%	-17%	0.00%	0%	0%
200	3,333	2,102	0.07	0.44	6.43	0.00	19.20	2,104	0.07	0.26	3.71	0.00	5.57	2,104	0.07	0.20	3.08	0.00	3.00	0%	0%	-42%	0.00%	-4%	-17%
201	58	30	0.99	1.82	1.84	0.01	9.87	30	0.89	1.36	1.52	0.02	5.26	30	0.89	1.36	1.52	0.02	5.26	1%	-10%	-17%	0.00%	0%	0%
202	44	24	1.83	2.64	1.44	0.01	12.20	24	1.84	2.22	1.21	0.01	7.88	24	1.84	2.22	1.21	0.01	7.88	-1%	0%	-16%	0.00%	0%	0%
203	325	183	2.34	4.25	1.82	0.02	38.90	185	2.35	3.27	1.39	0.02	24.16	185	2.33	3.13	1.34	0.02	20.00	1%	0%	-23%	0.00%	-1%	-3%
204	254	137	2.19	3.86	1.76	0.00	25.10	140	2.18	3.18	1.46	0.00	16.60	140	2.18	3.18	1.46	0.00	16.60	2%	-1%	-17%	0.00%	0%	0%
205	125	73	1.66	4.72	2.85	0.00	32.40	73	1.67	4.26	2.54	0.00	32.06	73	1.51	3.15	2.09	0.00	20.00	0%	1%	-11%	0.00%	-10%	-18%
206	219	116	1.37	4.41	3.22	0.00	61.40	117	1.36	2.94	2.17	0.02	22.54	117	1.34	2.79	2.09	0.02	20.00	1%	-1%	-33%	0.00%	-2%	-4%
207	33	18	4.42	7.40	1.67	0.04	35.00	18	4.51	5.25	1.16	0.09	17.64	18	4.51	5.25	1.16	0.09	17.64	-2%	2%	-30%	0.00%	0%	0%
208	72	40	0.91	1.77	1.94	0.00	10.80	40	0.97	1.55	1.60	0.02	7.89	40	0.97	1.55	1.60	0.02	7.89	0%	6%	-17%	0.00%	0%	0%
209	8	4	1.78	1.59	0.89	0.21	4.28	4	1.82	1.22	0.67	0.58	3.37	4	1.82	1.22	0.67	0.58	3.37	-4%	2%	-25%	0.00%	0%	0%
210	320	169	2.00	4.24	2.13	0.00	51.30	170	2.05	3.26	1.59	0.02	21.66	170	2.04	3.20	1.57	0.02	20.00	1%	3%	-25%	0.00%	0%	-1%
211	6	2	0.86	1.65	1.92	0.25	6.47	3	0.45	0.23	0.50	0.25	0.69	3	0.45	0.23	0.50	0.25	0.69	32%	-47%	-74%	0.00%	0%	0%
300	1,633	910	0.09	0.44	4.90	0.00	7.41	921	0.10	0.42	4.44	0.00	6.15	921	0.09	0.31	3.58	0.00	3.00	1%	6%	-9%	0.00%	-11%	-19%
301	220	130	0.91	1.65	1.81	0.00	10.90	127	0.96	1.36	1.42	0.03	7.97	127	0.96	1.36	1.42	0.03	7.97	-3%	5%	-21%	0.00%	0%	0%
302	192	107	0.69	1.17	1.70	0.00	9.69	108	0.70	0.93	1.33	0.01	5.29	108	0.70	0.93	1.33	0.01	5.29	1%	1%	-22%	0.00%	0%	0%
303	38	24	0.84	1.11	1.33	0.01	4.62	25	0.80	0.98	1.23	0.05	3.88	25	0.80	0.98	1.23	0.05	3.88	3%	-5%	-7%	0.00%	0%	0%
304	25	15	0.36	0.40	1.11	0.03	1.34	15	0.39	0.42	1.07	0.06	1.34	15	0.39	0.42	1.07	0.06	1.34	3%	8%	-4%	0.00%	0%	0%
400	2,630	16,317	0.00	0.05	21.69	0.00	31.60	16,317	0.00	0.03	13.60	0.00	2.33	16,317	0.00	0.02	8.51	0.00	0.50	0%	0%	-37%	0.00%	-14%	-37%
500	14,769	20,919	0.02	0.29	11.81	0.00	51.30	20,932	0.02	0.17	7.18	0.00	9.80	20,932	0.02	0.10	4.83	0.00	1.50	0%	-2%	-39%	0.00%	-12%	-33%
600	7,872	35,383	0.01	0.10	16.73	0.00	8.57	35,385	0.01	0.07	12.74	0.00	5.14	35,385	0.01	0.05	10.24	0.00	1.50	0%	1%	-24%	0.00%	-8%	-20%
Total Mineralized	**4,166**	**2,276**	**2.20**					**2,283**	**2.21**					**2,283**	**2.19**					**0%**	**0%**		**0.00%**	**-1%**	
Total BIF	**8,622**	**5,089**	**0.09**					**5,095**	**0.09**					**5,095**	**0.08**					**0%**	**0%**		**0.00%**	**-10%**	
Host rocks	25,271	72,619	0.01					72,634	0.01					72,634	0.01					0%	-1%		0.00%	-11%	

Source: SRK (2021).

Figure 14-46: Grade Probability Plot (Left) and Capping Sensitivity Curve (Right for Group Domain 199, São Sebastião Deposit



Source: SRK (2021).

14.6.5 Bulk Density

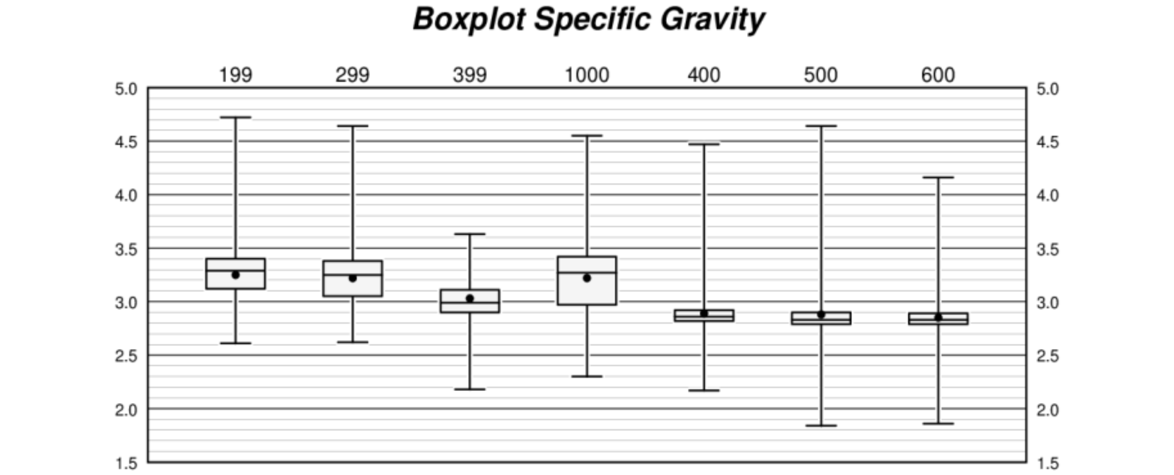
A description of the bulk density determinations are presented in SRK (2021) as follows:

"Specific gravity was measured using standard weight in water/weight in air methodology on the core from 10-centimetre sample intervals. The specific gravity database contains 30,505 measurements, representing an 18% increase in specific gravity measurements since the 2017 resource model. Figure 14-47 shows the boxplots of the specific gravity measurements by estimation domains.

Specific gravity was estimate in the block model for domains 199, 299, 399, and 1000, as detailed in the following estimation section. For host rocks (domains 400, 500, and 600), an average specific gravity of 2.89 t/m^3, 2,88 t/m^3, and 2.86 t/m^3 was assigned, respectively.

Unlike grade composites, which are 1.0 metre lengths, specific gravity data are only 10 centimetres in length and are not collected continuously down the core. Compositing of specific gravity was not possible, and given the small support, estimation parameters for specific gravity were choses to yield a smooth interpolation result. Specific gravity data were also capped, to avoid any extreme low and/or high values for estimation. Chosen cap values for specific gravity are provided in Table 14-57; the impact of capping on the average specific gravity was less than 1% for all zones. In comparison with IAMGOLD's 2017 model, the Biquinho mineralized zone is characterized by higher specific gravity (+8%) whereas Pimentão and Tomate have comparable mean values (0% and -5%, respectively). This is attributed to updates in the estimation dataset as well as to substantial reinterpretation of the mineralized domains."

Figure 14-47: Boxplot of Specific Gravity by Estimation Domains, São Sebastião Deposit



	199	299	399	1000	400	500	600	
Number of data	2148	1419	397	7619	2008	11343	5568	Number of data
Mean	3.25	3.22	3.03	3.22	2.89	2.88	2.86	Mean
Std. Dev.	0.22	0.23	0.19	0.26	0.15	0.17	0.13	Std. Dev.
Coef. of Var.	0.07	0.07	0.06	0.08	0.05	0.06	0.05	Coef. of Var.
Maximum	4.72	4.64	3.63	4.55	4.47	4.64	4.16	Maximum
Upper quartile	3.4	3.38	3.11	3.42	2.92	2.9	2.89	Upper quartile
Median	3.29	3.25	2.99	3.27	2.86	2.83	2.83	Median
Lower quartile	3.12	3.05	2.9	2.97	2.82	2.79	2.79	Lower quartile
Minimum	2.61	2.62	2.18	2.3	2.17	1.84	1.86	Minimum

Source: SRK (2021).

Table 14-57: Cap Values and Associated Statistics for Specific Gravity, São Sebastião Deposit

Domain	Samples	Mean	Std. Dev*	Minimum	Maximum	CoV*	No. Capped
199	2,148	3.25	0.22	2.61	4.00	0.07	4
299	1,419	3.22	0.23	2.62	3.80	0.07	8
399	397	3.03	0.19	2.50	3.63	0.06	1
1000	7,619	3.22	0.26	2.50	4.00	0.08	14

Note. * Std. Dev. = Standard Deviation, CoV = Coefficient of Variation

14.6.6 Variography

Determination of the variographic parameters is described in SRK (2021) as follows:

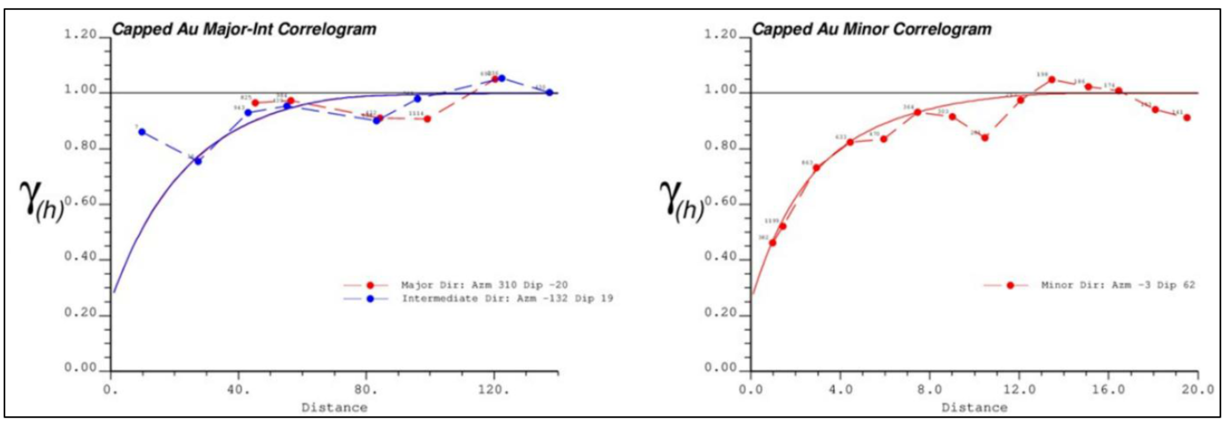
"SRK used the Geostatistical Software Library (GSLib) to calculate and model gold variograms for the mineralized and BIF domains (Table 14-58). For each domain, SRK assessed three different spatial metrics: (1) traditional semi-variogram of gold, (2) correlogram of gold, and (3) traditional semi-variogram of normal scores of gold. Downhole variograms were calculated to determine the nugget effect. Figure 14-48 shows an example variogram model for group 199 (Biquinho mineralized zones)."

Table 14-58: Gold Variograms by Domains, São Sebastião Deposit

Rock Code	GSLIB Angles			Leapfrog Angles			Variogram Model						
	ANG1	ANG2	ANG3	Dip	Dip Az	Pitch	Nugget*	Str. No.	Type*	CC*	Strike Range (X)	Dip Range (Y)	Vert Range (Z)
199	310	-20	20	28	357	47	0.25	1	Exp	0.6	60	60	4
								2	Sph	0.15	80	80	8
299	310	-20	20	28	357	47	0.20	1	Exp	0.6	45	60	2
								2	Sph	0.2	45	90	5
399	315	-20	0	20	315	90	0.25	1	Exp	0.3	12	12	1
								2	Sph	0.45	90	90	6
1000	310	-20	20	28	357	47	0.20	1	Exp	0.6	50	50	4
								2	Sph	0.2	50	50	9

Notes: Str. No = structure number, Exp = Exponential, Sph = Spherical, CC = variance contribution

Figure 14-48: Gold Variogram Biquinho Mineralized Zone (199 Group), São Sebastião Deposit



Source: SRK (2021).

14.6.7 Block Model Construction

A description of the block model construction parameters is provided in SRK (2021) as follows:

"The selection of the block size considered the borehole spacing, composite length, the geometry of the modelled zone and the anticipated mining method. A block size of 10 m x 10 m x 2 m was chosen, with sub-cells at a resolution of 5 m x 5 m x 1 m to better reflect the shape of the mineralized domain. Sub-cells were assigned the same values as their parent cell. The Z rotation of 345º was applied to the block model to better reflect the dip direction of the mineralized zones. The block model definition is summarized in Table . The sub-celling is efficient in filling the wireframe volumes. The block model was assigned the domain codes from the wireframes."

Table 14-59: São Sebastião Gold Deposit Block Model Specifications

Axis	Block Size (m)	Origin*	Number of Cells	Rotation
X	10	533,649.264	125	0
Y	10	7,816,873.997	198	0
Z	2	150	400	345

Note. * Corrego Alegre Datum, UTM Zone 23S

14.6.8 Search Strategy and Grade Interpolation Parameters

A description of the search strategy and estimation methods was described in SRK (2021) as follows:

“The block model was populated with a gold value using ordinary kriging in the mineralized domains, with three estimation runs using progressively relaxed search ellipsoids and data requirements. The first estimation pass uses a search radius up to the variogram range. The second pass uses a radius set to 2.0 times the variogram range. The third pass was used to fill the rest of the block model. All passes used an ellipsoidal search. The estimation ellipse ranges and orientations are based on the variogram models developed for the various domains within the deposit, and generally conform to the orientation of the individual zones. One exception is domain 210 within Pimentão, which was modelled as a folded structure; for this domain, a dynamic orientation of the search was used in estimation due to its complex geometry. The three host rock domains (400, 500, and 600) were estimated using inverse distance weighting with a power of 2.

Specific gravity was estimated in all mineralized and BIF domains (groups 199, 29, 399, and 1000) applying two estimation runs using inverse distance weighting with a power of 2. Mean values were assigned for host rocks (400, 500, and 600).

Table summarizes the data requirements for gold grade and specific gravity estimation. In all cases, gold and specific gravity were estimated using a hard boundary approach separately within every domain.

Table 14-60: Estimation Parameters for Gold and Specific Gravity

<table>
<tr><th rowspan="2">Domain Group</th><th rowspan="2">Name</th><th rowspan="2">Pass</th><th colspan="4">Estimation Gold</th><th colspan="5">Estimation SG</th></tr>
<tr><th>Ranges, m (X, Y, Z)</th><th>Number of Data (min, max)</th><th>Max. Comp per Hole</th><th>Estimator</th><th>Run</th><th>Ranges, m (X, Y, Z)</th><th>Number of Data (min, max)</th><th>Max. Samp per Hole</th><th>Estimator</th></tr>
<tr><td rowspan="3">199</td><td rowspan="3">Biquinho</td><td>First</td><td>80x80x40</td><td rowspan="12">5/12
3/16
2/20</td><td rowspan="12">2
2
2</td><td rowspan="9">OK</td><td rowspan="9">First
Second</td><td rowspan="9">200x200x80
1500x1500x500</td><td rowspan="9">6/20
6/40</td><td rowspan="9">5
5</td><td rowspan="9">IDW2</td></tr>
<tr><td>Second</td><td>160x160x80</td></tr>
<tr><td>Third</td><td>400x400x200</td></tr>
<tr><td rowspan="3">299</td><td rowspan="3">Pimentão</td><td>First</td><td>90x90x40</td></tr>
<tr><td>Second</td><td>180x180x80</td></tr>
<tr><td>Third</td><td>450x450x200</td></tr>
<tr><td rowspan="3">399</td><td rowspan="3">Tomate</td><td>First</td><td>90x90x40</td></tr>
<tr><td>Second</td><td>180x180x80</td></tr>
<tr><td>Third</td><td>450x450x200</td></tr>
<tr><td rowspan="3">1000
400
500
600</td><td rowspan="3">BIF
Ultramafic
Metasediments
Schists</td><td>First</td><td>100x100x40</td><td rowspan="3">IDW2</td><td colspan="5" rowspan="3">Assigned Average</td></tr>
<tr><td>Second</td><td>200x200x80</td></tr>
<tr><td>Third</td><td>1500x1500x500</td></tr>
</table>

Source: SRK (2021).

Several estimation sensitivity scenarios were considered before applying the final set of estimation parameters. The final set of parameters were selected on the basis of model validation checks discussed in the next section, including change of support checks, model swath plot reviews, and grade-tonnage comparisons at zero cut-off grade. The impact of alternative interpretation of variogram models with slightly longer ranges was checked for the largest mineralized domains (101, 103, 203, 204, and 210). This resulted in a negligible impact of less than 1% difference in the average gold grade.

A hard boundary between the mineralized and unmineralized zones within BIF domains was uses in the base case model. As a sensitivity, a soft boundary was tested which allowed all the samples within the BIF domains to influence the volume of both mineralized and unmineralized portions of the BIF zone. This is equivalent to the estimation of the entire BIF domains, without any distinct mineralized sub-domains. This scenario resulted in up to 25% more grade and metal in the in-situ mode; however, at a 2.5 g/t Au cut-off grade value, this yielded 32% less tonnage, ad 8% lower grade to give 41% fewer ounces. SRK considers this to have a material impact; however, the presence of continuous mineralized zones within the BIF domains is confirmed from the core review and anomalies observed in gold, arsenic, and sulfur distribution. In SRK's opinion, the use of had boundaries prevents unreasonable grade smearing into the large BIF domains delineated by the lithology criteria only.

SRK developed the estimation using Leapfrog Edge software as a base case and compared the estimation results against Datamine Studio RM software for the large mineralized Biquinho and Pimentão domains 101, 102, 203, 204, and 210. This resulted in a 0.04% total difference in gold grade for all domains, which SRK considers to be immaterial.

One more sensitivity estimation check was conducted for specific gravity. SRK applied less smoothing in the estimation to increase the variability of the estimation results in the block model, which resulted in less than 1% difference for mineralized domains and confirms that specific gravity estimation is not sensitive to the estimation parameters."

14.6.9 Block Model Validation

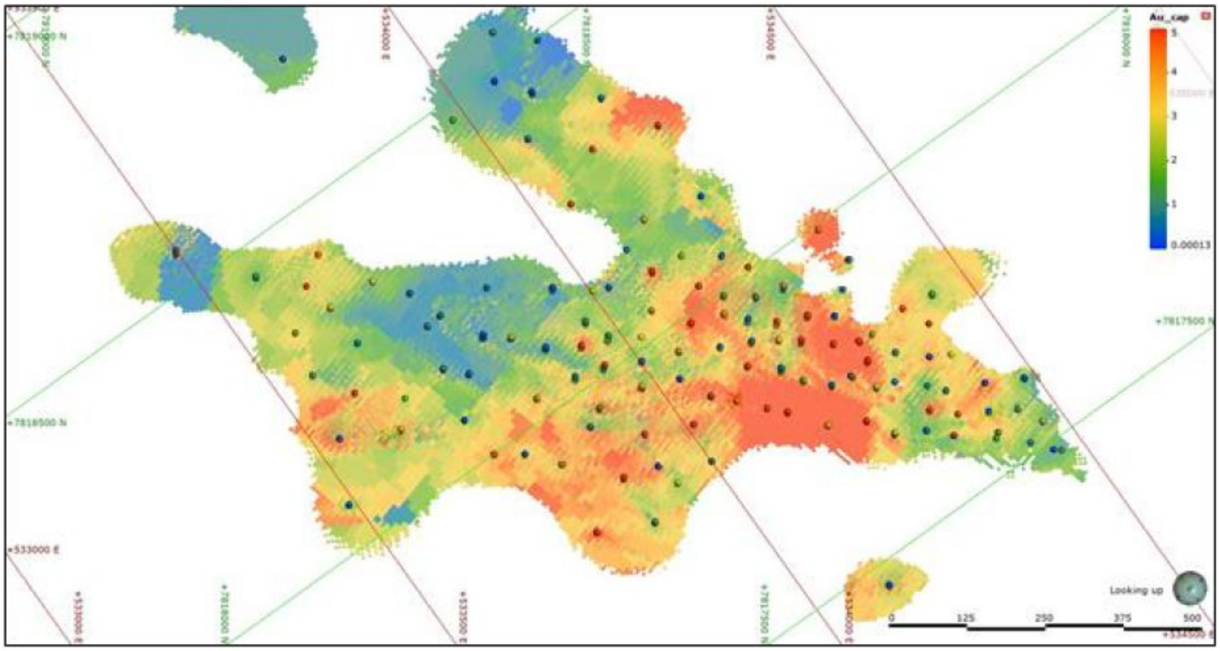
Block model validation activities completed were described in SRK (2021) as follows:

"SRK validated the block model using visual comparison of block estimates and informing composites, and statistical comparisons between composites and block model distributions at zero cut-offs. Every estimated domain was visually compared against the informing composites (Figure 14-49). No significant deviations between the block model and informing data were found.

A swath plot showing the ordinary kriged block model, clustered and nearest neighbours declustered composites is provided in Figure 14-50. This shows generally good agreement between the ordinary kriged block model and the nearest neighbour's declustered data.

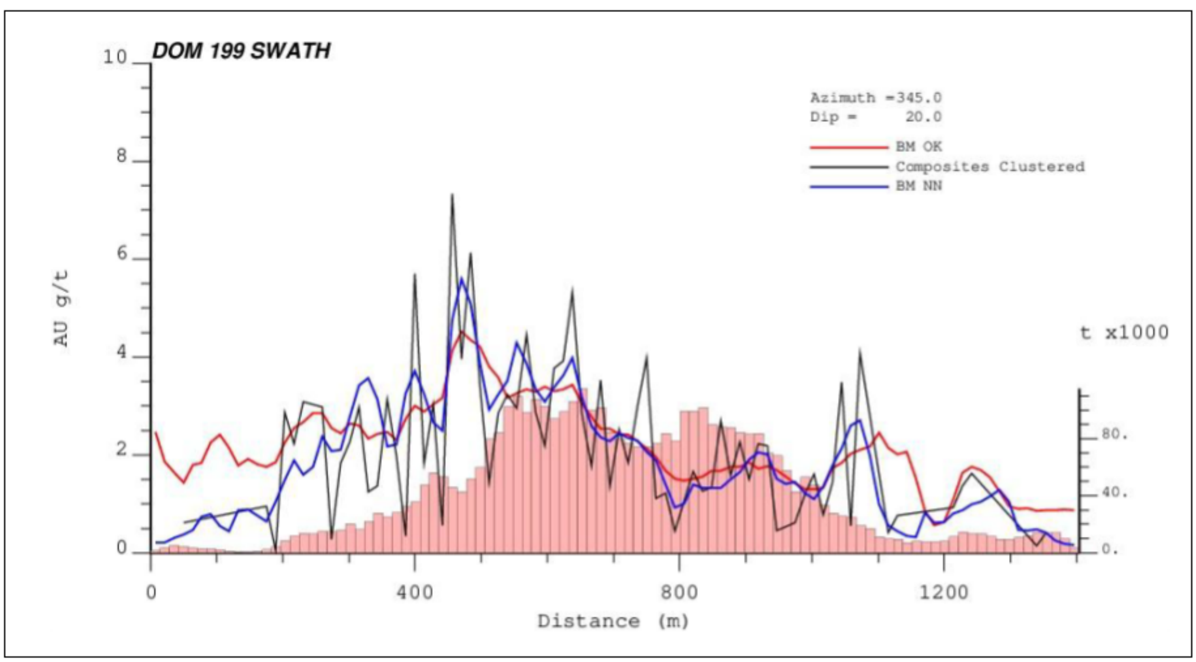
The nearest neighbour model was constructed using re-composited data (i.e. composited to two metres to retain consistency with the block height). A check was also performed to determine if capping thresholds should be changed given use of bigger composites.

Figure 14-49: Visual Validation of the Block Model Against Informing Composites (Domain 101), São Sebastião Deposit



Source: SRK (2021).

Figure 14-50: Swath Plot of Block Model for Biquinho Mineralized Zones, Oriented Along Dip, São Sebastião Deposit.



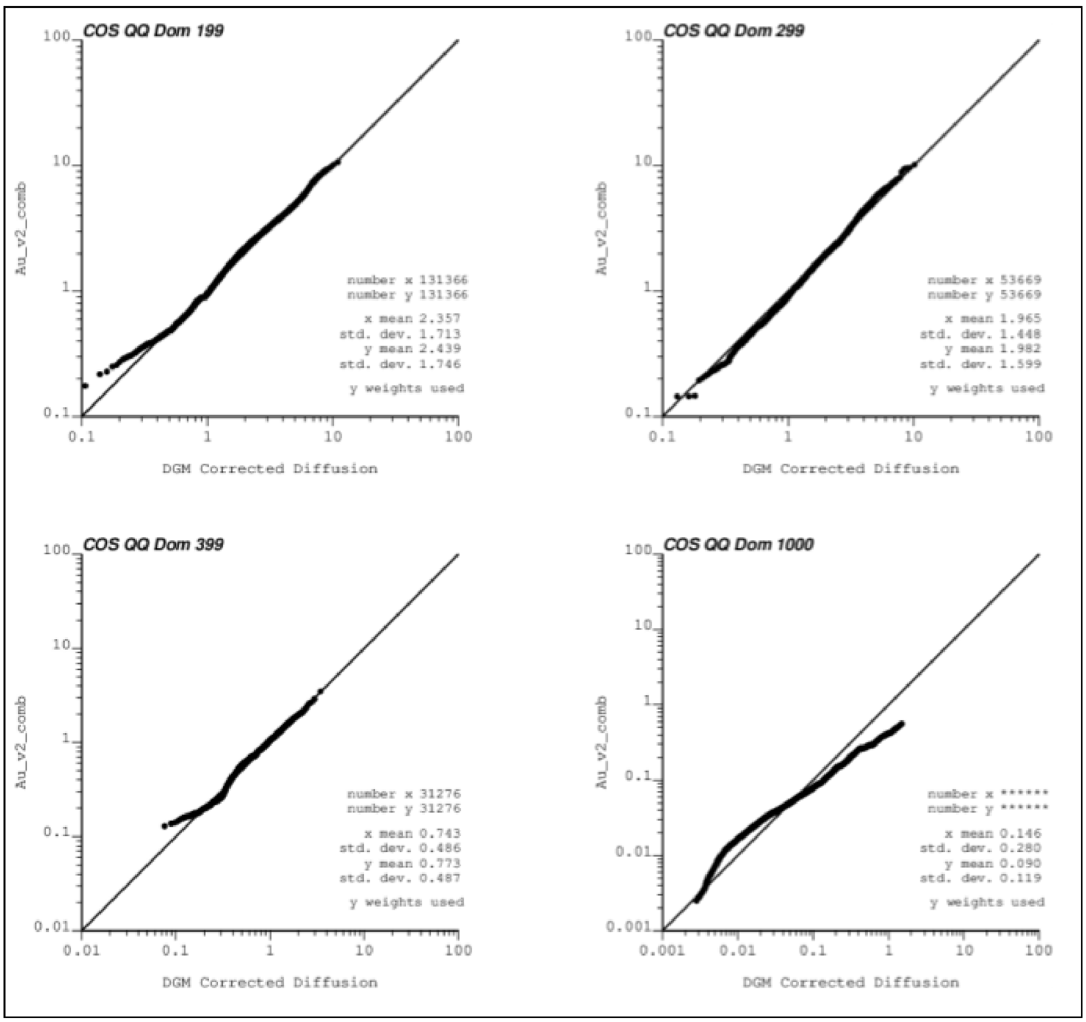
Notes: Histogram corresponds to block model tonnage along swath

Source: SRK (2021).

SRK also did a change of support check for the mineralized grouped zones of 199, 299, 399, and 1000. This involved a comparison of the ordinary kriging block model against change-ogf-support adjusted declustered composites that inform each domain.

Declustering mitigates the influence of preferential sampling of borehole data; this often results in a distribution of composites whose mean statistic is often comparable to that of the estimated model. Further, a change-of-support correction is applied to account for the volume variance between the composite scale and the final block volume scale. A quantile-quantile plot was used to compare the declustered, change-of-support corrected distribution to the estimated block model grades (Figure 14-51). In general, the estimated model corresponds well to the declustered, change-of-support corrected distributions. This is especially true for the mineralized zones within the BIF layers."

Figure 14-51: Comparison of Quantile-Quantile Plot for Block Model Grades and Declustered and Change of Support Corrected Distribution, São Sebastião Deposit



Source: SRK (2021).

14.6.10 Mineral Resource Classification

The methods and procedures used to classify material into either the Measured, Indicated, or Inferred Mineral Resource categories is described in SRK (2021) as follows:

"Mineral resource classification is typically a subjective concept. Industry best practices suggest that resource classification should consider the confidence in the geological continuity of the mineralized structures, the quality and quantity of exploration data supporting the estimates, and the geostatistical confidence in the tonnage and grade estimates. Appropriate classification criteria should aim at integrating these concepts to delineate regular areas at similar resource classification.

The block classification strategy considers borehole spacing, geologic confidence, and continuity of classification criteria. SRK considers that there are no Measured blocks within the Pitangui gold deposit. To differentiate between Indicated and Inferred, a separate block model was created solely to assist with block classification using an estimation run that accounts for the geometric configuration of the available boreholes. The criteria for block classification are:

Indicated:

- Blocks estimated within a 50 m x 50 m x 50 m search radius, using a minimum of three boreholes and belonging to the largest mineralized domains (101, 102, 152, 203, 204, 206, 208, and 210). This nominally corresponds to a regular borehole spacing of 60 m to 70 m. The mean average distance of informing composites for this category is within 50 m, the average number of boreholes used to estimate Indicated blocks is 5 (Figure 14-52).
- Relatively thin areas of the mineralized domains (less than two metres thickness) were excluded from the Indicated category. Some thin areas were, however, preserved to maintain the continuity of the category and/or in the high grade areas where the thinner intersection may be justified economically.

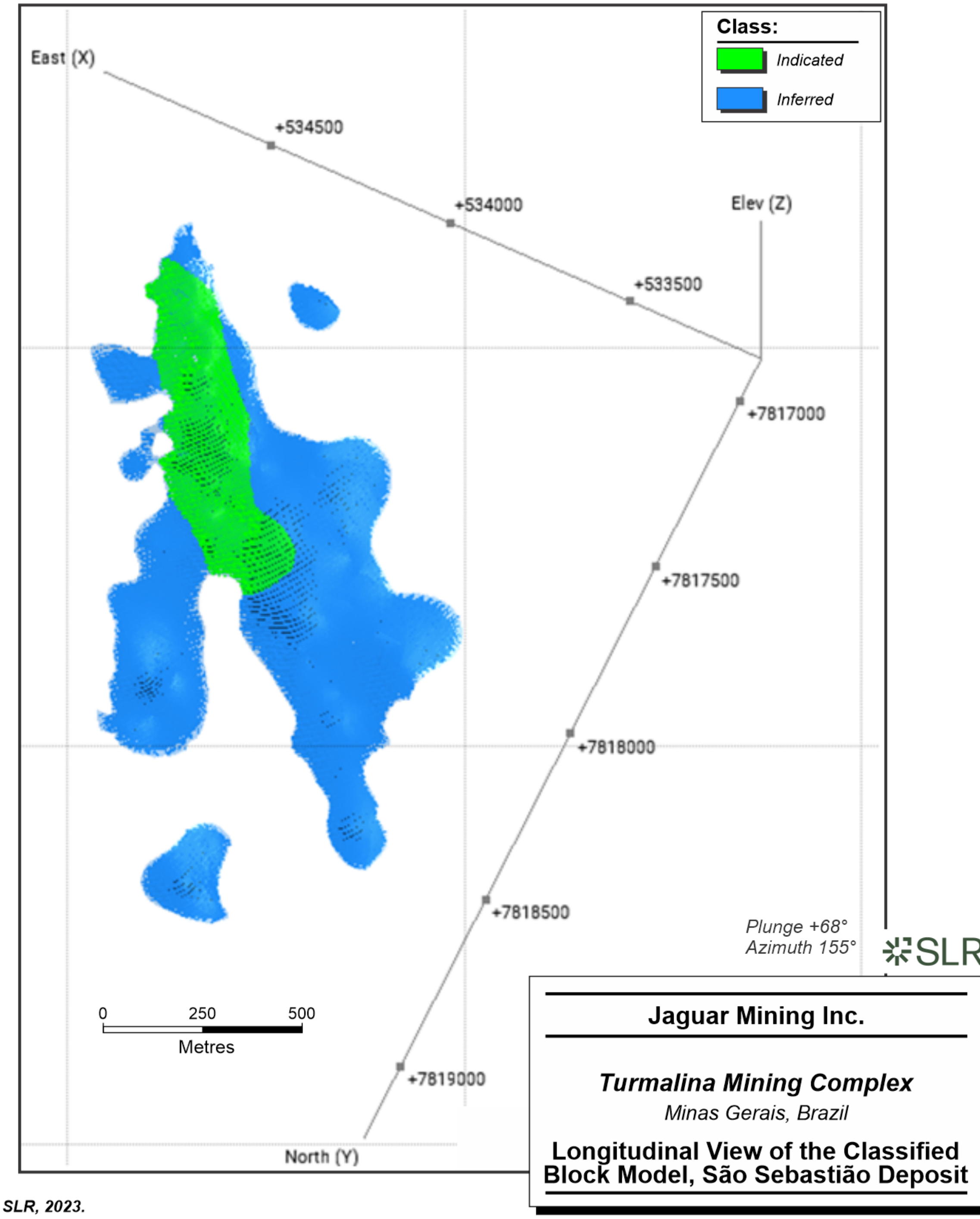
Inferred:

- All blocks not classified as Indicated within mineralized domains (groups 199, 299, and 399). This nominally corresponds to a regular borehole spacing of 100 m to 125 m.
- All blocks within host rocks (domains 100, 200, 300, 400, 500, and 600) were unclassified.

SRK examined the classification visually by inspecting sections and plans throughout the block model and performed classification smoothing to ensure continuity of classification strategies, as required. SRK concluded that the material classified as Indicated reflects estimates made with a moderate level of confidence within the meaning of CIM (2014) definitions, and all other material is estimated at a lower confidence level."

SLR reviewed the SRK classification described above and found it to be acceptable and in accordance with the definitions contained in CIM (2014). A view of the classified block model is provided in Figure 14-52.

Figure 14-52: Longitudinal View of the Classified Block Model, São Sebastião Deposit



Source: SLR, 2023.

14.6.11 Cut-off Grade Parameters

On December 2, 2019, IAMGOLD published a Mineral Resource estimate prepared by SRK for the Pitangui Project using a block cut-off grade of 2.50 g/t Au (SRK, 2020). The input parameters used to derive this cut-off grade are presented in Table 14-61.

Table 14-61: SRK 2020 Cut-off Grade Input Parameters

Parameter	Units	Value
Gold price	US$ per ounce	1,500
Exchange rate	US$/C$	1.10
Mining costs	US$ per tonne mined	31.70
Processing costs	US$ per tonne of feed	50.70
General and administration	US$ per tonne of feed	5.30
Mining dilution	Percent	20
Mining recovery	Percent	85
Process recovery	Percent	93
Assumed process rate	Tonnes per day	400,000
Assumed mining rate	Tonnes per day	1,100

Just a few days before the Mineral Resource was disclosed, the CIM released the CIM Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines. The Mineral Resource published by IAMGOLD was therefore not aligned with the updated best practices endorsed by the CIM, which required that Mineral Resource statements for underground mining scenarios satisfy the "reasonable prospects for eventual economic extraction" (RPEEE) by demonstrating the spatial continuity of the mineralization within a potentially mineable shape.

SLR prepared an updated Mineral Resource statement using an updated cut-off 2.25 g/t Au grade and newly created reporting panels measuring 5 m x 5 m x 2 m, thus satisfying the RPEEE by reporting within a potentially mineable shape.

The current cut-off grade was calculated using a gold price of US$1,800/oz, an exchange rate of BRL5.20:US$1.00, average gold recovery of 85.8%, and forecast 2023 operating costs for mining, processing, general and administration, taxes, and refining of BRL572.90/t (US$110.17/t). Gold prices are based on consensus, long term forecasts from banks, financial institutions, and other sources.

The application of potentially mineable shapes to a Mineral Resource helps ensure RPEEE in three ways. First, reporting Pitangui using panels with a minimum height of two metres ensures the reasonable prospects of material that was not modeled to a minimum thickness of two metres by incorporating the requisite dilution required to achieve a two metres minimum mining height. Second, reporting at a block cut-off has the ability to exclude material below the cut-off grade that is spatially tightly interwoven with the material above the cut-off grade. In this case, the risk to the accuracy of the Mineral Resource statement arises when lower grade material cannot be physically excluded and must be extracted as part of the mining process as internal dilution; the use of reporting panels for Pitangui accounts for this internal dilution. Thirdly, reporting at a block cut-off also has the ability to effectively recover isolated blocks of material above the cut-off grade. In many cases, underground mining methods may not extract such blocks without significant dilution and/or much higher costs, and they must be excluded from the Mineral Resource statement. In the instance of Pitangui, a small number of isolated higher grade blocks that generated isolated reporting panels were excluded from reporting the final Mineral Resource.

14.6.12 Mineral Resource Estimate

The Mineral Resources are presented in Table 14-62 and are illustrated in Figure 14 18

Table 14-62: Summary of Mineral Resources as of November 30, 2023, São Sebastião Deposit

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Measured	0	0	0
Indicated	3,423	4.07	448
Sub-total, Measured and Indicated	*3,423*	*4.07*	*448*
Inferred	3,343	3.53	379

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources are estimated at a cut-off grade of 2.25 g/t Au for the São Sebastião deposit.
4. Mineral Resources at the São Sebastião deposit include all drill hole and channel sample data as of July 29, 2019.
5. Mineral Resources are estimated using a long term gold price of US$1,800/oz Au.
6. Mineral Resources are estimated using an average long term foreign exchange rate of R$5.20 : US$1.00.
7. A minimum mining width of approximately two metres was used.
8. Gold grades are estimated by the OK and the Inverse Distance, Power 2 interpolation algorithms using capped composite samples.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not sum due to rounding.

14.6.13 Factors Affecting the Mineral Resource

Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. At the present time, the SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues that may have a material impact on the Zona Basal deposit Mineral Resource estimate other than those discussed below.

Factors that may affect the São Sebastião deposit Mineral Resource estimates include:

- Metal price and exchange rate assumptions
- Changes to the assumptions used to generate the cut-off grade used for construction of the mineralized wireframe domains
- Changes to geological and mineralization shape and geological and grade continuity assumptions and interpretations
- Due to the natural variability inherent with gold mineralization in mesothermal gold deposits, the presence, location, size, shape, and grade of the actual mineralization located between the existing sample points may differ from the current interpretation. The level of uncertainty in these items is lowest for the Measured Mineral Resource category and is highest for the Inferred Mineral Resource category.

- Changes to the understanding of the current geological and mineralization shapes and geological and grade continuity resulting from acquisition of additional geological and assay information from future drilling or sampling programs
- Changes in the treatment of high grade gold values
- Changes due to the assignment of density values
- Changes to the input and design parameter assumptions that pertain to the assumptions for creation of underground constraining volumes

14.6.14 Comparison with Previous Mineral Resource Estimate

A comparison of the current São Sebastião deposit Mineral Resources with the previous Mineral Resources effective December 2, 2019, is presented in Table 14-18.

Table 14-63: Comparison of Historical Mineral Resources, December 2, 2019, versus Current Mineral Resources as at November 30, 2023

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Historical Mineral Resources as at December 2, 2019 (IAMGOLD)			
Measured	0	0	0
Indicated	3,330	4.39	470
Measured + Indicated	**3,330**	**4.39**	**470**
Inferred	3,559	3.78	433
Mineral Resources as at November 30, 2023			
Measured	0	0	0
Indicated	3,423	4.07	448
Measured + Indicated	**3,423**	**4.07**	**448**
Inferred	3,343	3.53	379
Difference			
Measured	0	0	0
Indicated	+90	-0.32	-22
Measured + Indicated	**+93**	**+0.32**	**-22**
Inferred	-216	-0.25	-54

15.0 Mineral Reserve Estimates

15.1 Summary

Table 15-1 summarizes the Mineral Reserve estimate for the MTL Complex, including Reserves from Turmalina Orebodies A, B, and C, and the Faina orebody.

Table 15-1: Summary of Mineral Reserves – July 31, 2023

	Proven			Probable			Proven and Probable Reserves		
Deposit	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Orebody A	299	4.62	44	78	3.38	9	377	4.37	53
Orebody B	271	3.26	23	104	3.50	12	321	3.34	34
Orebody C	309	3.32	33	679	3.30	72	988	3.30	105
Subtotal Turmalina	**824**	**3.78**	**100**	**862**	**3.33**	**92**	**1,686**	**3.55**	**192**
Faina				787	5.22	132	787	5.22	132
Total Turmalina UG	**824**	**3.78**	**100**	**1,648**	**4.23**	**224**	**2,472**	**4.08**	**324**

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 2.39 g/t Au for orebodies A, B, and C. For Faina, the Mineral Reserves are estimated at a cut-off grade of 4.00 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of US$1,650 per ounce and a BRL/US$ exchange rate of 5.20.
4. A minimum mining width of 3.5 m was used at Orebodies A, B, and C and 2 m at Faina.
5. Bulk density is 2.85 t/m^3.
6. Numbers may not add due to rounding.

The QP is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

15.2 Dilution

The dilution added for sub level stoping is 0.5 m for both the hanging wall and footwall. No dilution is added to development.

15.3 Extraction

The following extraction factors are used underground:

- Stoping 95%
- Blind Stope / Remnants 90%
- Rib Pillar 50%
- Development / Slashing 100%

15.4 Cut-off Grade

Metal prices used for Reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources. For resources, metal prices used are slightly higher than those for reserves.

Table 15-2 provides the inputs used for the Cut-off Grade (COG) inputs used for reserves. Faina is a sulphide deposit and has a lower mill recovery rate. The COG for orebodies A, B, and C is 2.39 g/t and the COG for Faina is 4.00 g/t.

Table 15-2: Summary of Cut-Off Grade Inputs – July 31, 2023

Parameter	Unit	Turmalina Mine	Faina
Gold Price	US$/oz	1,650	1,650
Exchange Rate	BRL/US$	5.20	5.20
Mining Costs			
Labour	US$/t	14.53	14.53
Maintenance	US$/t	9.36	9.36
Electricity	US$/t	1.98	1.98
External services	US$/t	6.00	6.00
Mining Materials	US$/t	10.39	10.39
Direct Costs	**US$/t**	**42.26**	**42.26**
Mining Taxes	US$/t	5.86	5.86
Indirect Costs	**US$/t**	**5.86**	**5.86**
Total Mining	**US$/t**	**47.94**	**47.94**
Processing Costs	US$/t		
Labour	US$/t	5.32	5.32
Maintenance	US$/t	2.16	2.16
Electricity	US$/t	4.42	4.42
External services	US$/t	4.41	4.41
Plant Consumables	US$/t	12.61	20.27
Direct Costs	**US$/t**	**29.12**	**36.78**
G&A	US$/t	7.07	7.07
Refinery	US$/t	0.31	0.31
Indirect Costs	**US$/t**	**7.38**	**7.38**
Total Processing	**US$/t**	**36.51**	**44.16**
Plant Recovery	**%**	**85.8**	**55.0**
Sustainable Capital	**US$/t**		
Primary Development	US$/t	24.51	24.51
Infill Drilling	US$/t	9.21	9.21

Parameter	Unit	Turmalina Mine	Faina
Equipment Engineering	US$/t	7.98	7.98
Reclamation / Closure (ARO)	US$/t	3.81	3.81
Non-Sustaining Capital / Growth	US$/t	16.51	16.51
Total Capex	**US$/t**	**54.59**	**54.59**
Reserves Cut-Off Grade	**g/t**	**2.39**	**4.00**

16.0 Mining Methods

The Turmalina underground operations consist of several zones grouped into four orebodies – Orebodies A, B, C, and Faina. At present, the Turmalina Mine produces on average 1,350 tpd from Orebodies A, B, C, and Faina. Underground operations at depth in Orebody A have been temporarily paused due to unfavorable economic conditions.

Orebody A is folded and steeply east dipping, with a strike length of approximately 250 m to 300 m and an average thickness of six metres. Mineralization has been outlined to depths of 900 m below surface. The southern portion of Orebody A is composed of two parallel narrow veins. The northern portion of Orebody A is much the same as the southern portion, however, the two parallel zones nearly, or completely, merge, forming a wider zone (up to 10 m) known as the Principal Zone.

Orebody B includes three thinner, lower grade lenses parallel to Orebody A. Two of the lenses are located approximately 50 m to 75 m to the east in the hanging wall and are accessed by a series of crosscuts that are driven from Orebody A. The mineralization in this deposit has been outlined along a strike length of approximately 350 m to 400 m and to depths of 900 m below surface. Orebody B is narrow along its entire strike length.

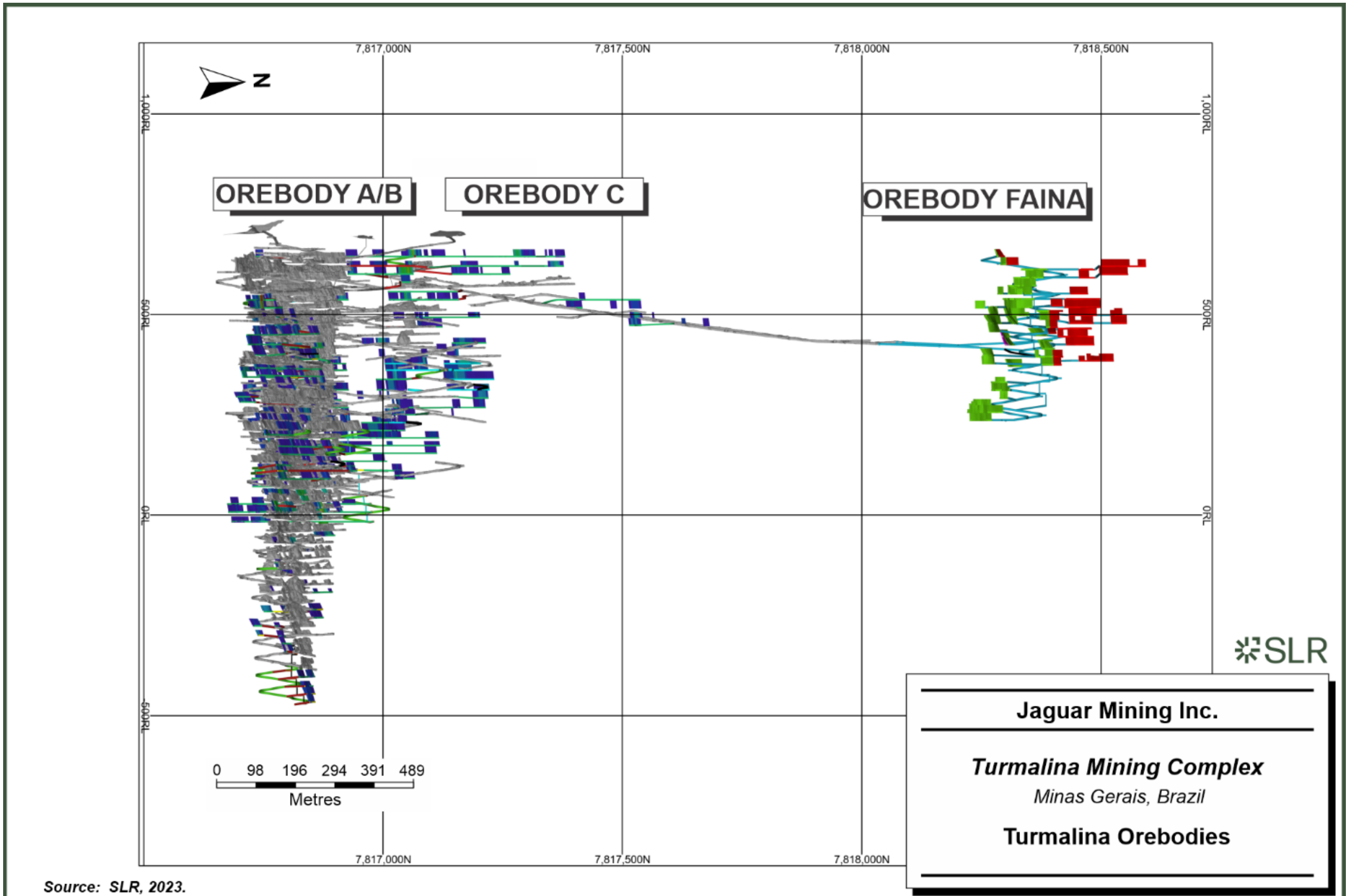
Orebody C is a series of 26 lenses that are located to the southwest in the structural footwall of Orebody A and are generally of lower grade. They strike northwest and dip steeply to the northeast. Orebody C has replaced Orebody A as the Complex's principal production source. The mineralization in this deposit has been outlined along a strike length of approximately 800 m to 850 m and to depths of 700 m to 750 m below surface.

Orebody Faina is a new orebody that development is currently approaching. There is a series of parallel structures similar to Orebody C that extend from surface to depth. A unique feature of the deposit is an offsetting striking lens based on the current geological interpretation. Mining will be done using SLOS retreat mining, bottom up, with delayed backfill.

The focus of mining at Turmalina is shifting from Orebodies A and B to Orebody C and Faina. Orebody C continues to grow with successful conversion of Resources to Reserves and Faina is a new orebody.

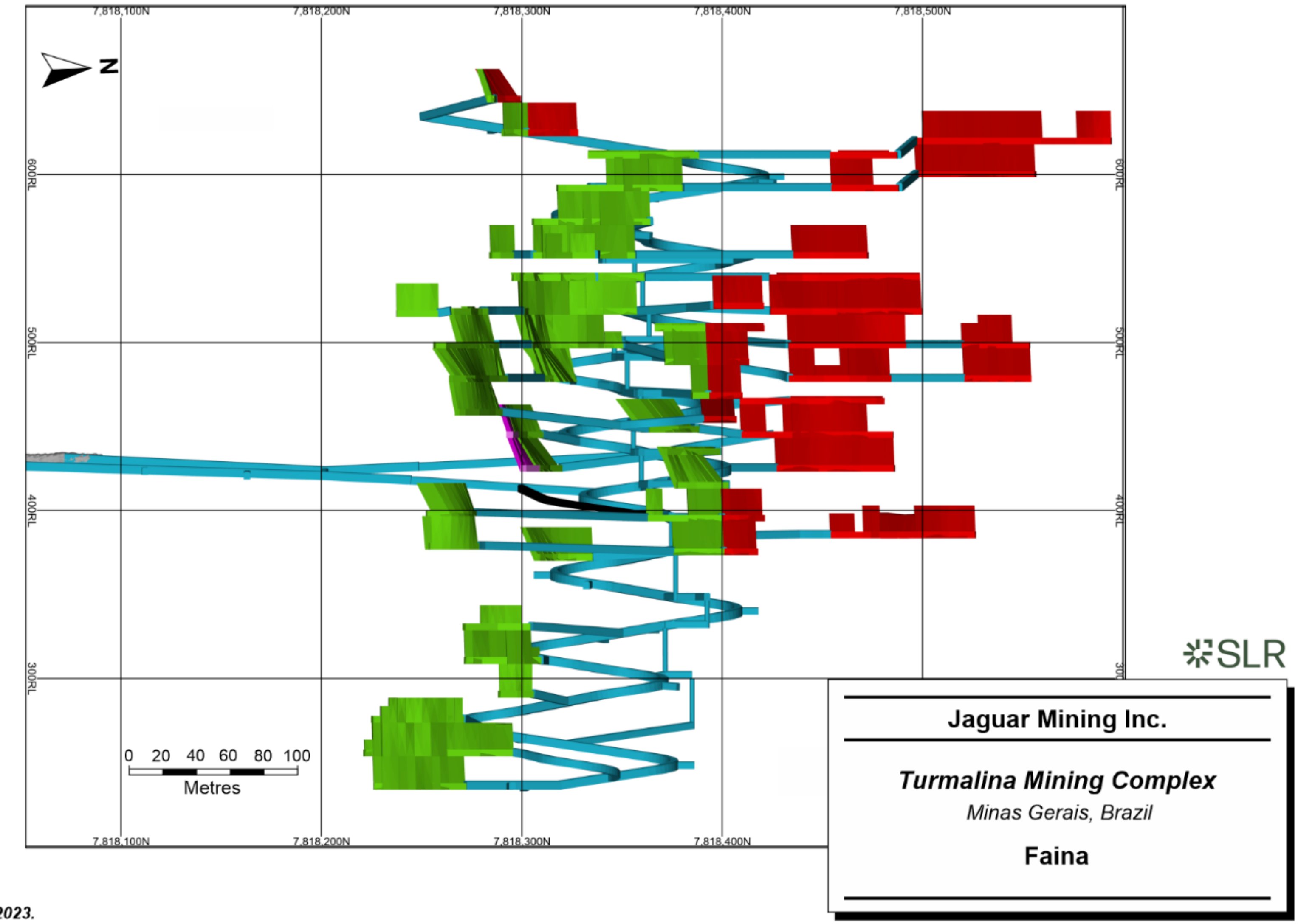
Figure 16-1 illustrates the mine development in Orebodies A, B, C, and Faina, including the access decline from Orebody C to Faina; Figure 16-2 presents mining activity at Faina only.

Figure 16-1: Turmalina Orebodies



Source: SLR, 2023.

Figure 16-2: Faina



Source: SLR, 2023.

16.1 Mine Design

Table 16-1 lists the parameters used in designing the mine plan for the Mineral Reserve estimate. The design was completed using Deswik software.

Table 16-1: Mine Design Parameters

Parameters	Units	Values
Stope Design		
Mining method		Sublevel Open Stoping
Default density – A	t/m^3	2.81
Default density – B	t/m^3	2.83
Default density – C	t/m^3	2.83
Default density – Faina	t/m^3	2.83
Stope height - Turmalina	m	20 / 15 (blind)
Stope height - Faina	m	20 / 20 (blind)
Stope length	m	5
Stope width minimum – Turmalina	m	3.5
Stope width minimum – Faina	m	2 + dilution
Stope width maximum	m	18
Stope pillar minimum – Turmalina	m	15
Stope pillar minimum – Faina	m	10
Dilution	m	0.5 (footwall) / 0.5 (hanging wall)
Minimum Dip	degrees	45°
Mine Design		
Rib pillar width	m	5
Maximum span	m	25
Maximum span – side	m	40
Level Height	m	63.7
Sill Height	m	8.7
Distance stope – ramp	m	60 (A) / 50 (C + Faina)
Distance between tunnels	m	10
Decline/Incline maximum grade	%	15.0%
Minimum ramp turning radius	degrees	25
Ore drive maximum grade	%	3 to 5%
Development Cross Sections		
Ramp	m	5.0 X 5.5

Parameters	Units	Values
Crosscut	m	4.0 X 5.0
Ore drive	m	4.0 X 4.0
Ventilation drive	m	4.0 X 4.5
Raise	m	3.0 (diameter)
Mine Factors		
Overbreak stope:	%	0%
Overbreak development:	%	0%
Extraction	%	95%
Extraction – blind stope/remnant	%	90%
Extraction – rib pillar	%	50%
Extraction – development (slash)	%	100%
Metallurgical recovery:	%	87.00% (Turmalina) / 55% (Faina)
Productivities		
Backfilling	t/day	1,000
Ramp	m/month	60
Crosscut	m/month	50
Ore drive	m/month	40
Ventilation drive	m/month	40
Raise	m/day	5

16.2 Mining Method

The mining method used at the Turmalina Mine (including Faina) is SLOS with delayed backfill. Both longitudinal and transverse versions of the method are used, depending on the width of the deposit. Access to the stopes is provided by sublevel development driven off the ramp. The sublevel interval is 20 m. The Turmalina deposit is mined in horizons between sublevels. Each horizon is mined in retreating fashion, starting at the end of the mineralized zone and progressing to the central crosscuts. The stope length is typically 40 m along strike, and rib pillars or partial rib pillars separate adjacent stopes. Once mined out, stopes are backfilled with cemented rockfill, unconsolidated rockfill, or paste fill. The horizons are mined in a bottom-up sequence between sill pillars.

The mining method used at Orebody A's Principal Zone is transverse SLOS. Stopes are 50 m to 60 m long along strike, and widths range from seven metres to 20 m. The Turmalina deposit has significant width in this zone due to the merging of two veins. As mentioned, Orebody A has stopped mining at depth, and is depleting existing reserves.

Figure 16-3 illustrates the sequencing of stopes in orebodies using transverse SLOS. The stopes in the central part of the Principal Zone are mined first, creating a vertical column of stopes from the lower to upper sill pillars. Once mined out, each stope is backfilled with paste fill. This approach creates a central paste fill pillar, which stabilizes the ground for mining the stopes on either side of it. The remaining stopes (stopes 4 to 15 in Figure 16-3) are mined in retreating fashion towards the access drifts on each end of the Principal Zone. The remaining stopes can use paste fill or rockfill. Partial rib pillars are left between backfilled stopes. The size of the partial rib pillars and thickness of the sill pillars are determined with geotechnical modelling.

Longitudinal SLOS is used in Orebody A outside the Principal Zone, in all of Orebody C, and in Faina. Figure 16-4 illustrates the sequencing of stopes with Longitudinal SLOS. When preparing a stope, a crosscut is driven to the deposit's hanging wall. From there, ore drives are driven in both directions along strike following the hanging wall contact. The hanging wall is supported with cable bolts before stoping begins. If the deposit is wider that five metres, ore will be left adjacent to the footwall, which will be slashed after the ore drive is completed. Figure 16-5 illustrates the typical layout for drilling a stope with Longitudinal SLOS. Figure 16-6 presents a cross section view showing a longhole drilling fan used in longitudinal SLOS.

Figure 16-3: Sequencing of Stopes with Transverse SLOS Mining

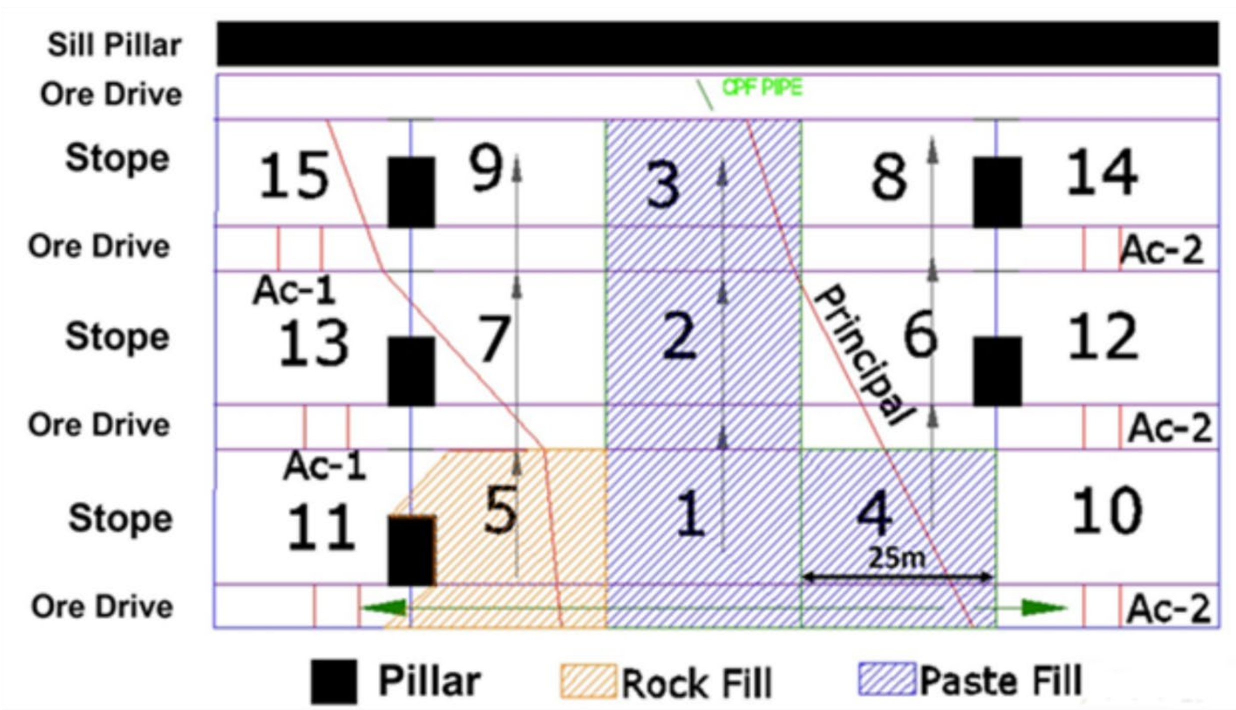


Figure 16-4: Sequencing of Stopes with Longitudinal SLOS

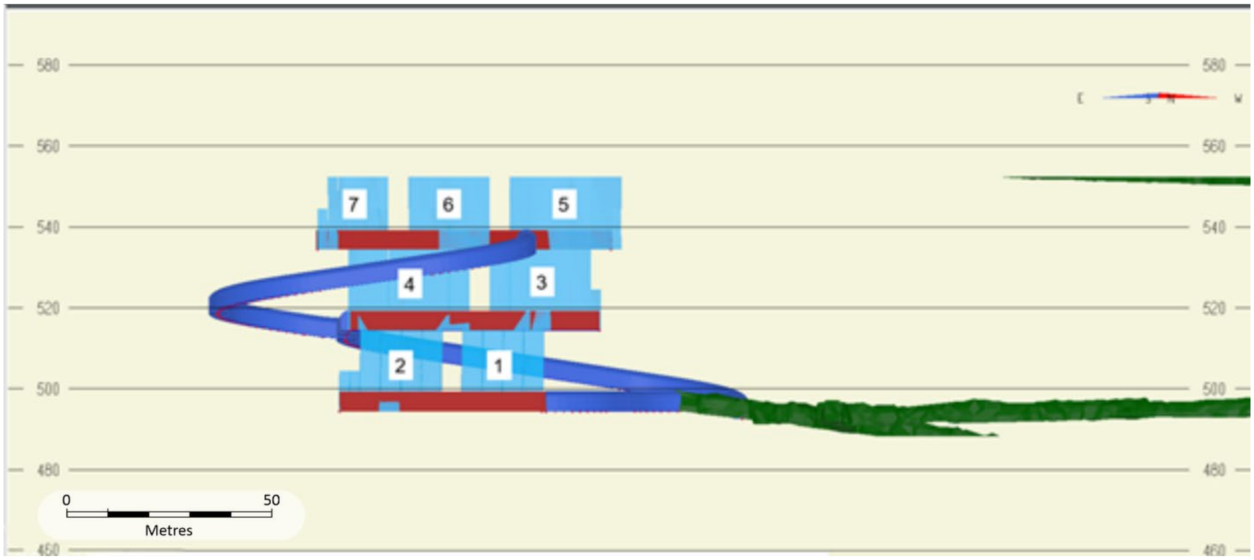


Figure 16-5: Typical Drilling Layout with Longitudinal SLOS

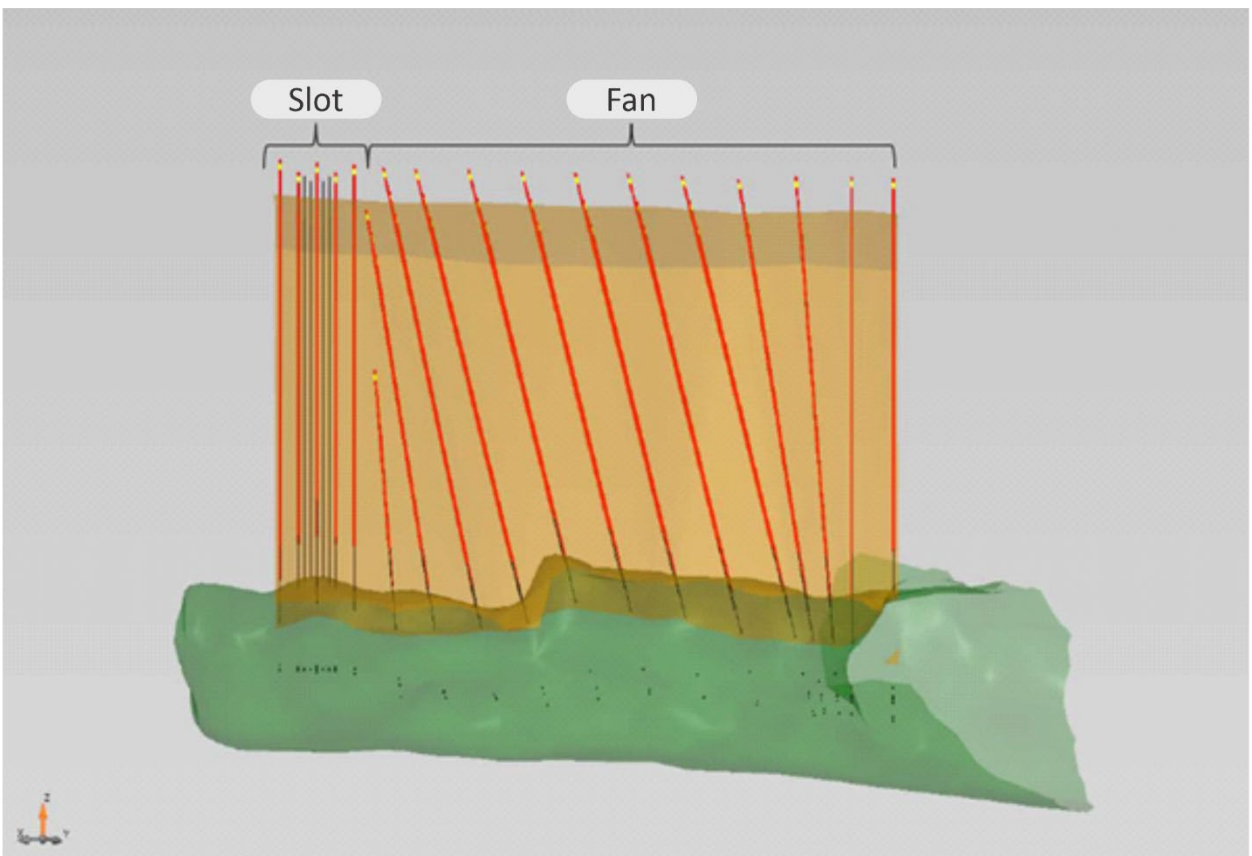
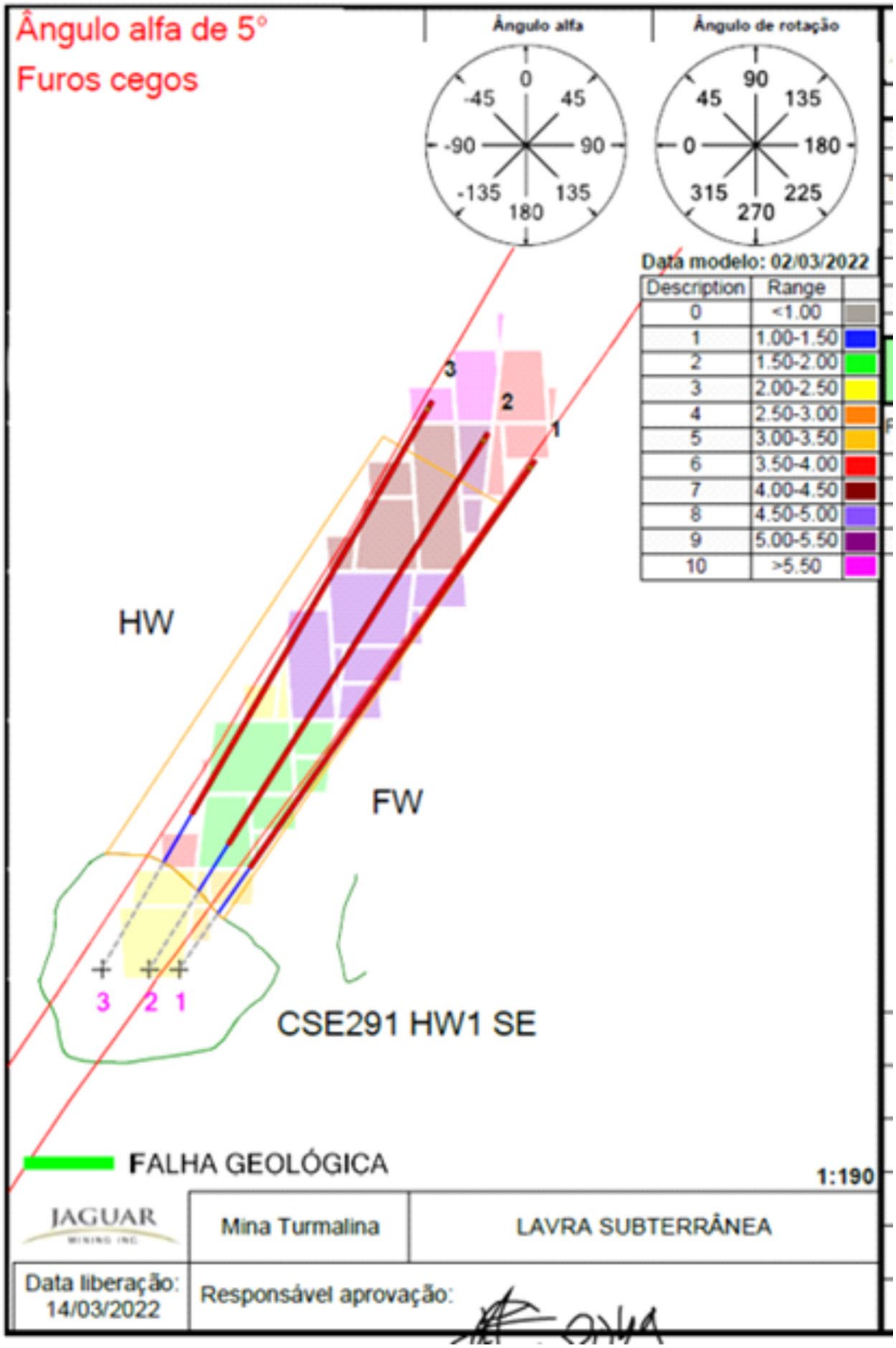


Figure 16-6: Cross Section Showing Longhole Fan with Longitudinal SLOS



16.3 Geomechanics and Ground Support

The following review of geomechanics summarizes the analysis described in the report *Geotechnical properties of Turmalina Mine*, 2018, by Jaime A. Corredor H (Corredor H., 2018). The report analyzes the rock mechanics parameters of Orebodies A and C based on geological information from Orebody A level 11 and Orebody C level 4. Furthermore, it provides recommendations for ground support procedures, stope design, and paste fill preparation. Faina is a new orebody on strike from Orebody C. The characteristics of Orebody C have been used in the design parameters for Faina.

Table 16-2 presents the rock material strengths, expressed as averages from UCS and tensile-strength tests, for Turmalina's predominant lithological units. Figure 16-7 and Figure 16-8 show the percentage distribution of RQD values for the footwalls and hanging walls of Orebodies A and C, respectively. Figure 16-9 and Figure 16-10 show the Q Index values for the main ramp and hanging wall in Orebodies A and C, respectively. Figure 16-11 indicates the geological strength index for each of the two orebodies. Figure 16-12 the empirical stable-regions graph prepared for stope design at Turmalina. It shows that a hydraulic radius ranging from 5 m to 7 m is appropriate for determining stope height and the distance between rib pillars. Based on the graph in Figure 16-13, the geotechnical report recommends that cable bolts have an effective length of nine metres and a 2.0 m x 2.0 m spacing pattern.

The report recommends the following procedures for determining the optimal paste fill recipe, based on laboratory UCS tests for paste fill strength (Table 16-2):

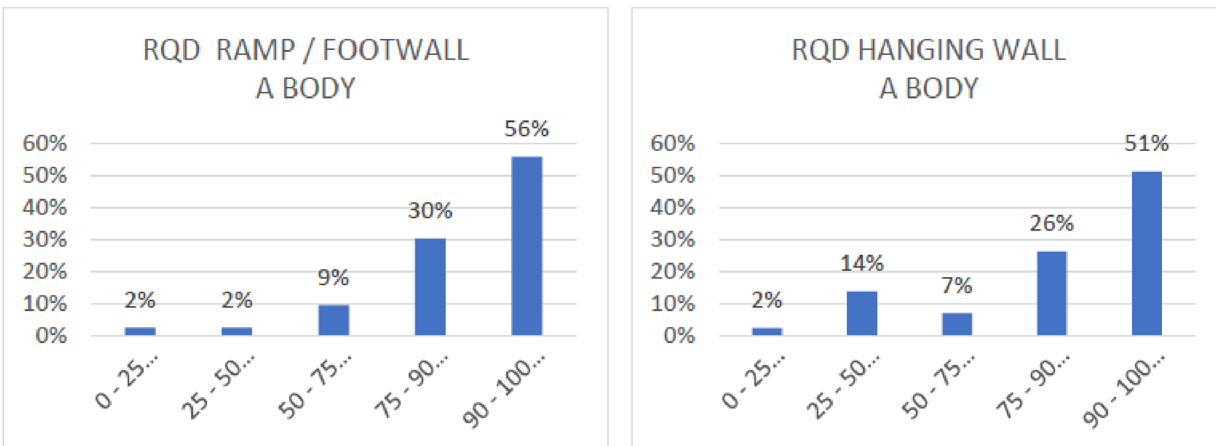
- Determine stope geometry (Height and Length) and Factor of Safety (FoS).
- Determine required paste strength using Belem & Benzaazoua´s formula for determining paste fill strength.
- Compare with Stope Length and FoS expressed using the graph of required paste fill strength versus stope length.
- Find the strength values in Figure 16-14.
- Determine the optimum cure time column (7, 28, or 56 days)
- Find the Solid % / Cement % composition.

Table 16-2: Rock Material Strengths for Turmalina Mine

Lithology	UCS (Mpa)	Elastic Modulus E (Gpa)	Poisson Ratio (v)	Tensile Strength (Mpa)
Amphibolite – Chloritic Schist	197.2	87.1	0.213	17.5
Biotite – Quartz schist (HW)	81.7	52.6	0.272	7.8
Bedded Iron Formation	142.8	72.7	0.154	8.2
Chloritic Schist (HW)	182.8	106.6	0.209	13.0
Granite	200.02	59.11	0.13	

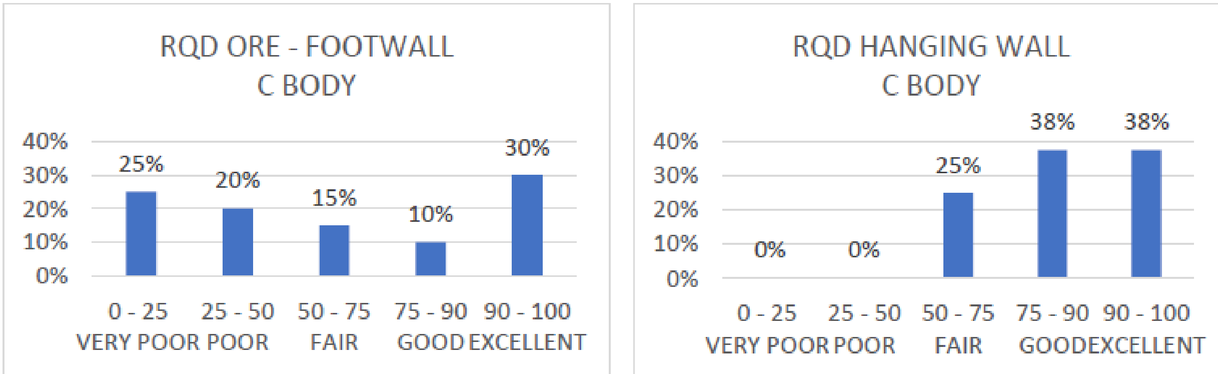
Source: Corredor H., 2018

Figure 16-7: RQD Values for Orebody A Footwall and Hanging Wall



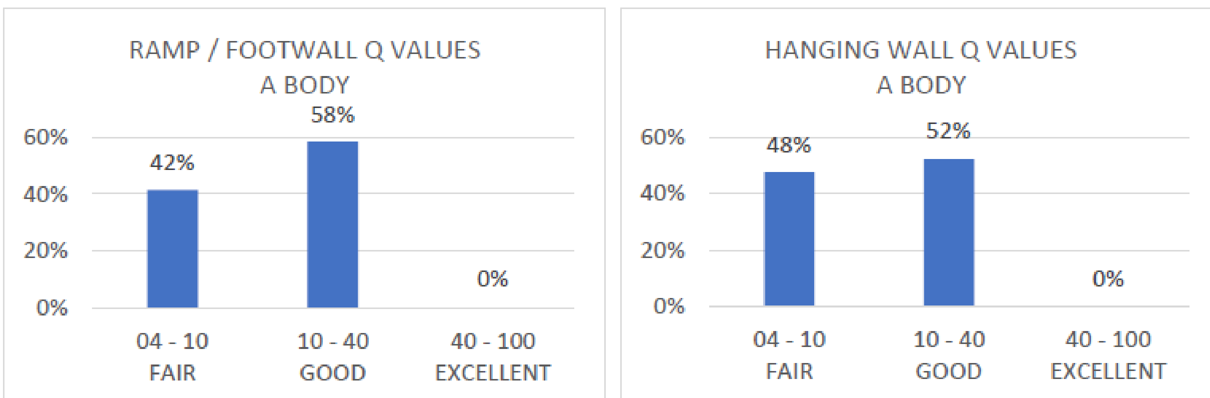
Source: Corredor H., 2018

Figure 16-8: RQD Values for Orebody C Footwall and Hanging Wall



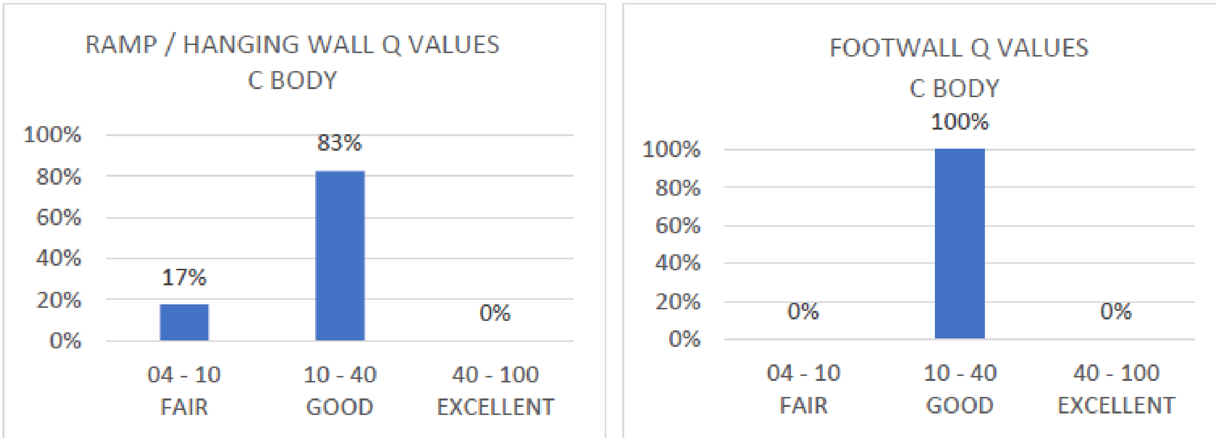
Source: Corredor H., 2018

Figure 16-9: Q' values for Ramp and Footwall in Orebody A



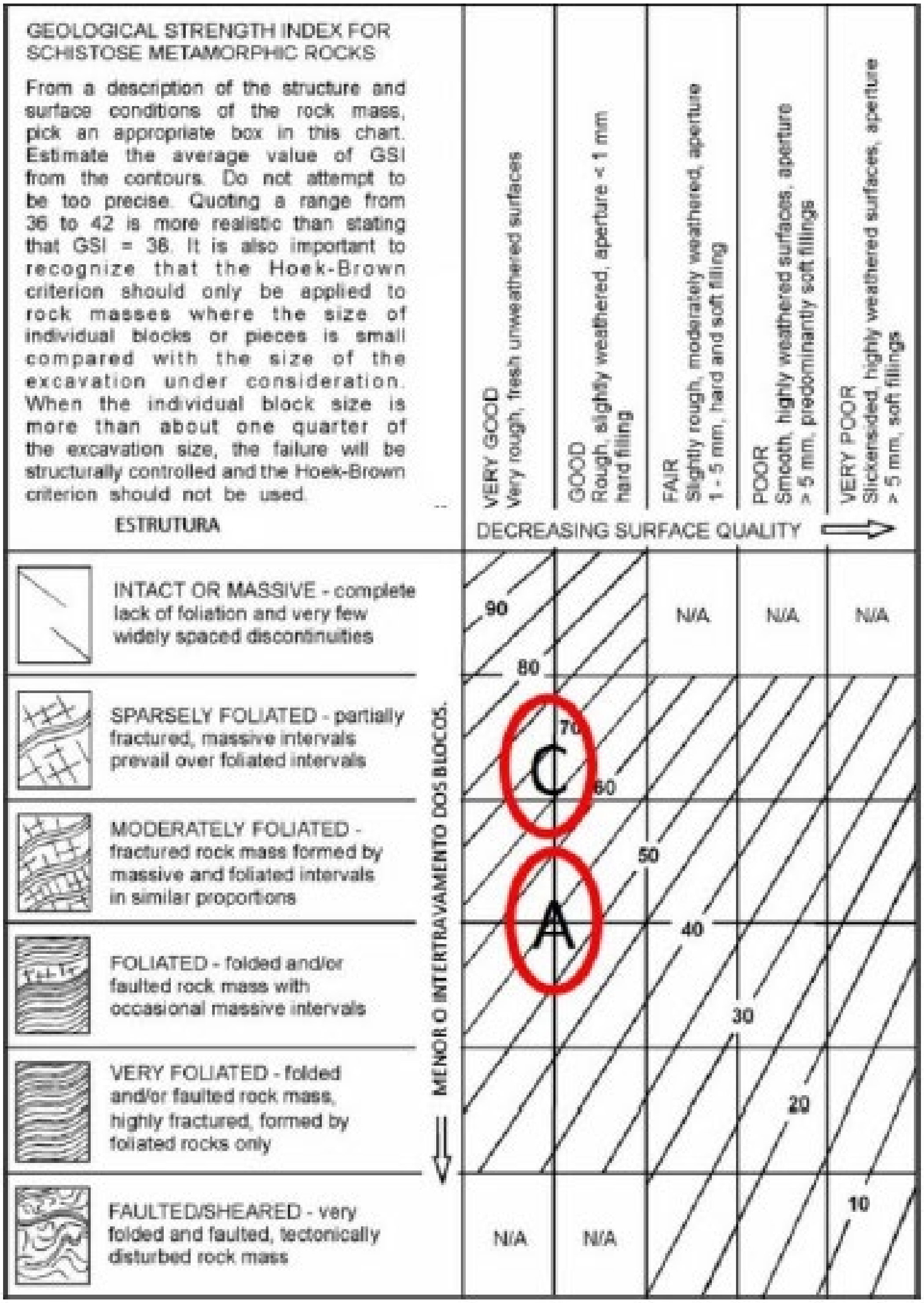
Source: Corredor H., 2018

Figure 16-10: Q' values for Main Ramp and Hanging Wall in Orebody C



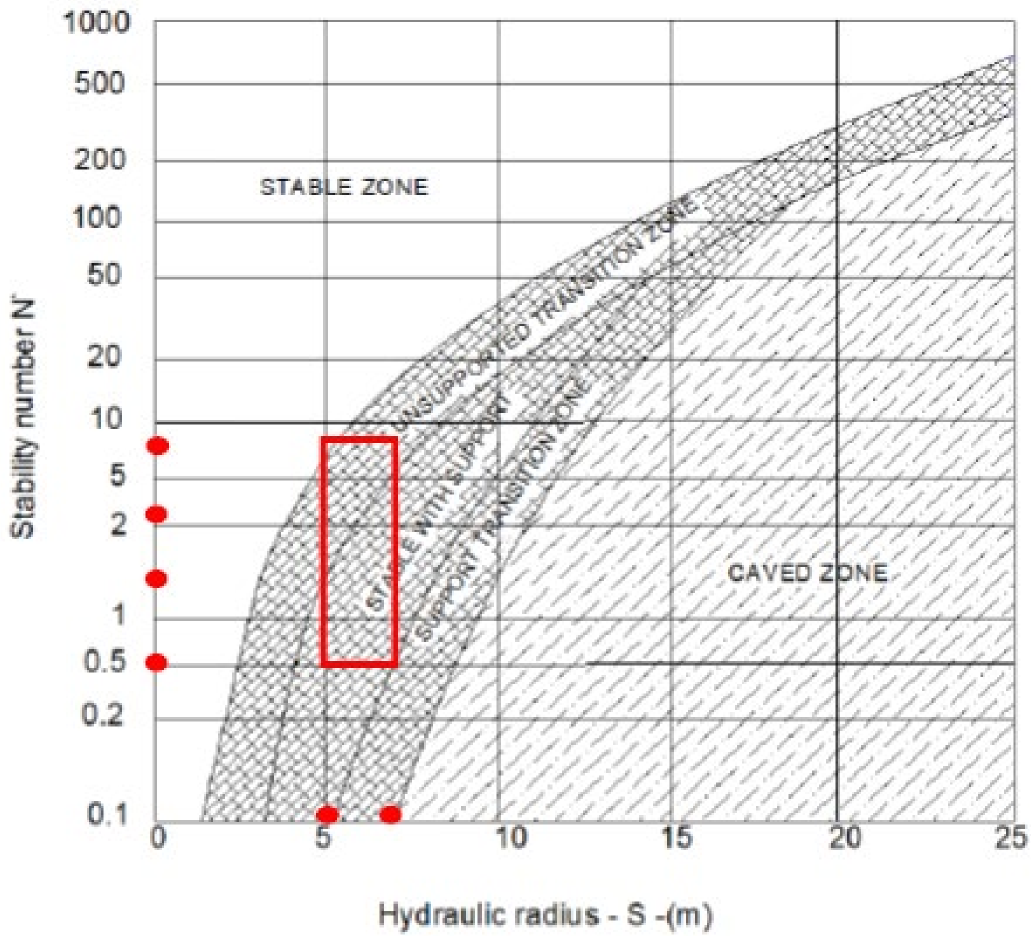
Source: Corredor H., 2018

Figure 16-11: Geological Strength Index Chart for Foliated Rocks Specifying the Most Suitable Regions for A and C



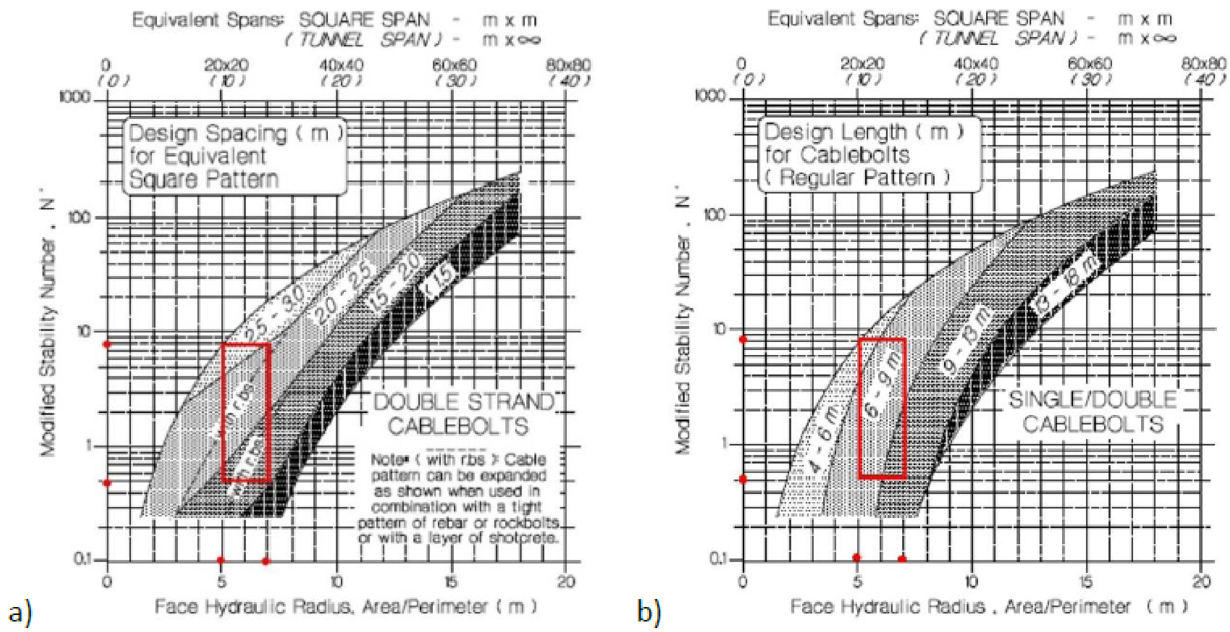
Source: Corredor H., 2018

Figure 16-12: Proposed Empirical Stable Regions Based on Stability Graphic for Turmalina Mine



Source: Corredor H., 2018

Figure 16-13: Specifications of Cable Bolt Spacing (a) and Length (b) for Geomechanical Conditions



Source: Corredor H., 2018

Figure 16-14: Paste Fill Strength Determination Results Based on Laboratory UCS Tests

Tempo de Cura		7 dias	28 dias	56 dias
% de Sólidos	% de Cimento	Ensaio de Resistência (kPa)		
CIMENTO TIPO CP II E32				
63%	3%	61,3	112,6	101,75
	5%	102,6	180,2	146,71
	8%	173,5	292,3	262,26
	10%	255,5	345,8	369,51
	12%	324,4	508,6	549,05
65%	3%	59,4	74,5	92,46
	5%	89,5	134,4	184,89
	8%	134,3	204,9	285,51
	10%	168,6	331,9	393,41
	12%	257,3	465,9	659,58
67%	3%	53,0	86,0	104,44
	5%	87,8	160,0	195,95
	8%	185,1	381,2	442,10
	10%	237,0	393,1	653,94
	12%	229,1	532,2	864,25
69%	2%	30,7	137,3	117,87
	4%	86,9	187,7	178,91
	5%	93,4	240,3	225,23
	6%	107,8	280,1	314,84
	8%	148,9	406,0	517,79
CIMENTO TIPO CP V ARI-RS				
65%	2%	64,2	100,9	88,64
	4%	123,5	214,4	187,21
	5%	138,5	221,1	252,72
	6%	209,3	258,2	389,23
	8%	340,3	604,3	824,14

Source: Corredor H., 2018, from Ausenco internal report, 2011.

Table 16-3 summarizes the Turmalina Mine's ground support procedures according to the type of mine excavation. The procedures generally call for 2.4 m long resin grouted helicoidal bolts be installed on a 1.5 m x 1.5 m pattern. Cable bolting is required in ore drift hanging walls with blocky ground and at intersections. Screens may also be required in specific situations and may be pinned to the rock with split sets.

Table 16-3: Ground Support Procedures

Excavation Type	Ground Support
Ramp	2.4 m long x 22 m dia. Resin grouted helicoidal bolts on 1.5 m x 1.5 m pattern
Sublevel Development	2.4 m long x 22 m dia. Resin grouted helicoidal bolts on 1.5 m x 1.5 m pattern
Intersections	2.4 m long x 22m dia. Resin grouted helicoidal bolts on 1.5m x 1.5m pattern
	Cement grouted cable bolts, 4, 7, or 10 m long. The pattern, angle, and length depend on the particular situation.
Crosscut	2.4 m long x 22 m dia. Resin grouted helicoidal bolts on 1.5 m x 1.5 m pattern
Ore Drift	2.4 m long x 22 m dia. Resin grouted helicoidal bolts on 1.5 m x 1.5 m pattern
	Cable bolting of hanging wall in areas with blocky ground.

16.4 Life of Mine Plan

The Turmalina Mine is going through a transitional period currently in terms of orebodies. Orebody A is near depletion, and Faina is being brought online to replace the production. Faina has a lower recovery rate due to the sulphides within the orebody. In SLR's opinion, the mine plan and schedule presented is plausible and feasible.

Stope and development designs, and production scheduling were carried out by Deswik Brazil using the Deswik mine design software. Mined out stopes and existing tunnels as of July 31, 2023, were supplied by Jaguar, to deplete them from the current mining plan.

The production schedule is summarized in Table 16-4 and covers a mine life of six years based on Mineral Reserves as presented in Table 15-1.

Table 16-4: Turmalina Complex Life of Mine Plan

Name	Units	Total	2023[1]	2024	2025	2026	2027	2028
ROM Tonnes Total	kt	**2,472**	173	431	599	601	589	79
ROM Au (oz)	oz	**324,185**	18,170	49,276	74,739	77,358	93,096	11,546
ROM Au (g/t)	g/t	**4.08**	3.26	3.56	3.88	4.00	4.92	4.52
ROM Au RecMet (oz)	oz	**236,633**	15,880	40,966	54,453	55,820	61,495	8,019
			-	-	-	-	-	-
Orebodies A–C			-	-	-	-	-	-
ROM Tonnes Total	kt	**1,685**	173	394	401	398	268	51
ROM Au (oz)	oz	**192,252**	18,170	43,341	44,037	44,050	36,963	5,692
ROM Au (g/t)	g/t	**3.55**	3.26	3.43	3.42	3.44	4.28	3.46
ROM Au RecMet (oz)	oz	**168,028**	15,880	37,880	38,488	38,500	32,305	4,975
			-	-	-	-	-	-
Faina			-	-	-	-	-	-
ROM Tonnes Total	kt	**787**	-	37	198	203	320	28

Name	Units	Total	2023[1]	2024	2025	2026	2027	2028
ROM Au (oz)	oz	**131,933**	-	5,935	30,702	33,308	56,133	5,854
ROM Au (g/t)	g/t	**5.22**	-	4.96	4.82	5.11	5.45	6.46
ROM Au RecMet (oz)	oz	**68,605**	-	3,086	15,965	17,320	29,189	3,044
			-	-	-	-	-	-
Total Development	m	**35,568**	2,761	8,081	8,349	8,484	7,790	103
Primary Development	m	**18,405**	1,191	4,353	3,808	4,862	4,191	-
Secondary Development	m	**16,803**	1,529	3,677	4,492	3,430	3,571	103
Vertical Development	m	**361**	41	51	49	193	28	-
Productive Development	m	**9,297**	941	1,755	2,530	1,949	2,085	37
Non-Productive Development	m	**25,911**	1,780	6,276	5,770	6,342	5,676	66
Total Development Tonnage	kt	**1,657**	116	381	389	416	351	4
Primary Development Tonnage	kt	**1,022**	60	246	219	282	215	-
Secondary Development Tonnage	kt	**629**	55	135	169	130	136	4
Vertical Development Tonnage	kt	**0.4**	0.0	0.1	0.0	0.2	0.0	-
Productive Development Tonnage	kt	**370**	34	68	102	79	86	1
Non-Productive Development Tonnage	kt	**1,281**	82	313	286	333	265	2

Notes:

7. For the period August 1, 2023 through December 31, 2023.

16.5 Mine Infrastructure

Turmalina mine infrastructure consists of ramp and ventilation raises to access the various orebodies. The mine has one ramp to surface and various ramps internally to service the orebodies. Table 16-5 lists Turmalina's mine infrastructure, stationary equipment, and mine services

A twin ramp system is developed to Faina to provide haulage and ventilation. Faina will have a ramp system and ventilation raise. A ventilation schematic is provided in Figure 16-15. As part of the Faina expansion, a new ventilation raise to surface has been developed with a new fan installation. Booster fans will be used to direct airflow to various parts of the mine.

The mine serviced by various compressors and pumps. A schematic of the mine's pumping system is provided in Figure 16-16. The water is pumped to surface, treated in the mill and then released. As mining shifts from Orebodies A and B, there is an opportunity to move infrastructure and optimize systems such as ventilation, pumping, and electrical.

The mine is serviced by a paste fill plant for backfill.

Table 16-5: Mine Infrastructure

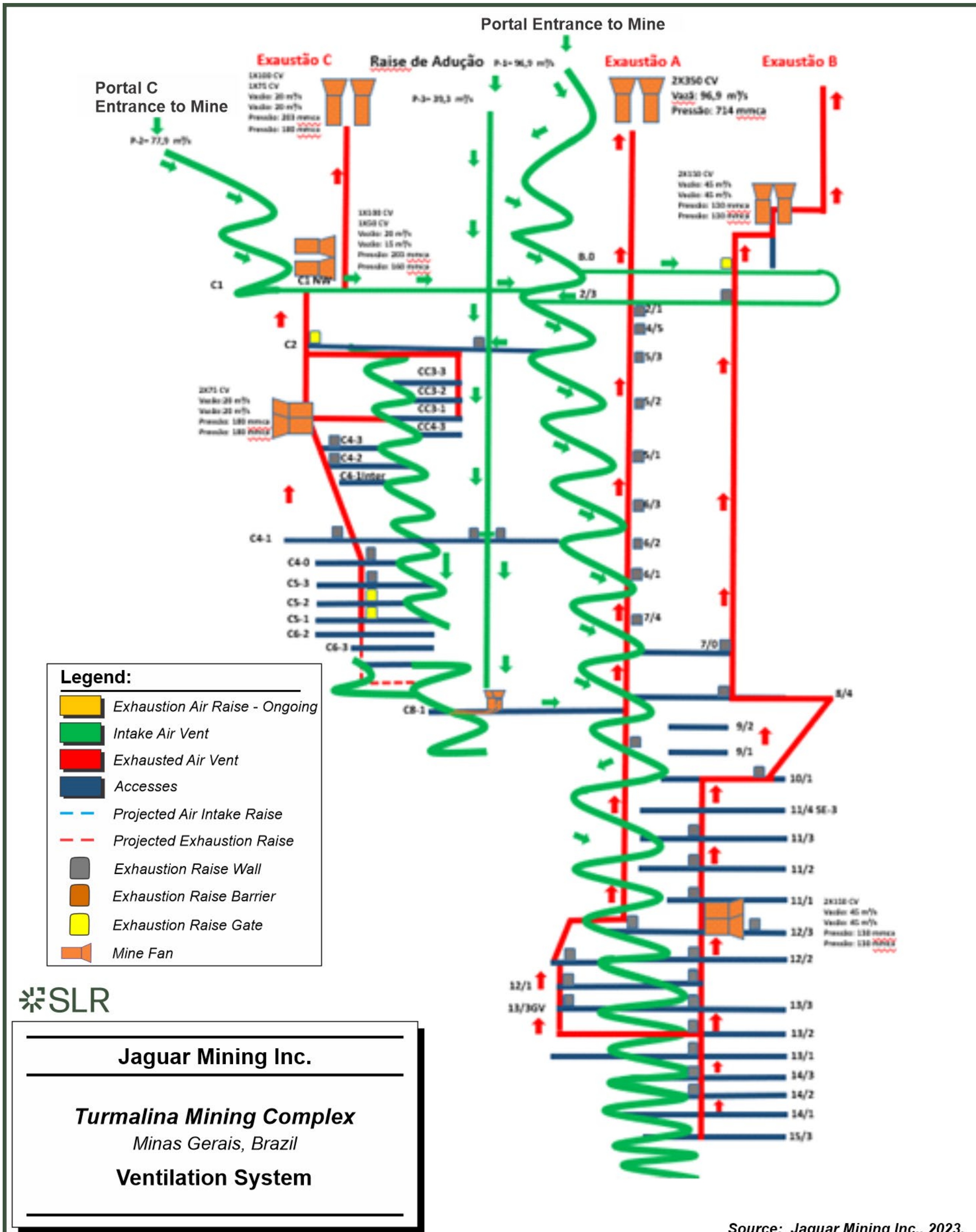
Infrastructure Item	Description	Location
Surface Installations		
Offices	1,145 m^2	Surface
Warehouse	420 m^2	Surface
Paste plant	100 t/h	Surface
Maintenance shop	2,395 m^2	Surface
Compressors		
• Compressor	90 kW	A3.5 level
Compressor	90 kW	A9.1 level
Compressor	90 kW	A11.2 level
Compressor	90 kW	C5.3 level
Development		
Ramps	5.0 m W x 5.5 m H	
Level development	4.3 m W x 4.8 m H	
Ventilation raise	994 m x 3.0 m diameter	
Ventilation raise	914 m x 3.0 m diameter	
Escapeway raise	3.0 l x 5.3 h / 3.0 l x 3.0 h	
Ventilation System		
Main ventilation fans	2 ea. X 448 kW	Surface
Main ventilation fans	2 ea. X 224 kW	Surface
Vent ducting	800, 1,000 & 1,200 mm dia.	
Electrical Installations		
Electrical Substation	8,750 kVA 13,800KV	Surface
Electrical Substation	500 kVA 13,800V/460V	B.0 level
Electrical Substation	500 kVA 13,800V/460V	A3.5 level
Electrical Substation	750 kVA 13,800V/460V	A7.3 level
Electrical Substation	500 kVA 13,800V/460V	A9.0 level
Electrical Substation	500 kVA 13,800V/460V	A12.3 level
Electrical Substation	500 kVA 13,800V/460V	A13.2 level
Electrical Substation	750 kVA 13,800V/460V	A14.3 level
Electrical Substation	500 kVA 13,800V/460V	C1 level
Electrical Substation	500 kVA 13,800V/460V	C2.3 level
Electrical Substation	500 kVA 13,800V/460V	CC4.3 level
Electrical Substation	500 kVA 13,800V/460V	C4.1 level

Infrastructure Item	Description	Location
Electrical Substation	500 kVA 13,800V/460V	C5.3 level
Electrical Substation	500 kVA 13,800V/460V	C5.1 level
Electrical Substation	750 kVA 13,800V/460V	C82 level
Dewatering System		
Pumping Station	37 kW / 50 m³/h	640 level
Pumping Station	37 kW / 50 m³/h	B.0 level
Pumping Station	37 kW / 50 m³/h	A2.3 level
Pumping Station	37 kW / 50 m³/h	A2.3 level
Pumping Station	37 kW / 50 m³/h	A2.1 level
Pumping Station	37 kW / 50 m³/h	A2.1 level
Pumping Station	37 kW / 50 m³/h	A3.4 level
Pumping Station	37 kW / 50 m³/h	A3.4 level
Pumping Station	37 kW / 50 m³/h	A3.1 level
Pumping Station	37 kW / 50 m³/h	A3.1 level
Pumping Station	37 kW / 50 m³/h	A4.2 level
Pumping Station	37 kW / 50 m³/h	A4.2 level
Pumping Station	37 kW / 50 m³/h	A5.3 level
Pumping Station	37 kW / 50 m³/h	A5.3 level
Pumping Station	37 kW / 50 m³/h	A6.3 level
Pumping Station	37 kW / 50 m³/h	A6.3 level
Pumping Station	37 kW / 50 m³/h	A7.3 level
Pumping Station	37 kW / 50 m³/h	A7.3 level
Pumping Station	37 kW / 50 m³/h	A8.4 level
Pumping Station	37 kW / 50 m³/h	A8.4 level
Pumping Station	37 kW / 50 m³/h	A9.3 level
Pumping Station	37 kW / 50 m³/h	A9.3 level
Pumping Station	37 kW / 50 m³/h	A10.3 level
Pumping Station	37 kW / 50 m³/h	A10.3 level
Pumping Station	37 kW / 50 m³/h	A11.3 level
Pumping Station	37 kW / 50 m³/h	A11.3 level
Pumping Station	37 kW / 50 m³/h	A12.3 level
Pumping Station	37 kW / 50 m³/h	A12.3 level
Pumping Station	37 kW / 50 m³/h	A12.1 level
Pumping Station	37 kW / 50 m³/h	A13.1 level

Infrastructure Item	Description	Location
Pumping Station	37 kW / 50 m³/h	C5.3 level
Pumping Station	37 kW / 50 m³/h	C5.1 level
Powder Magazines		
Explosives magazine	85,000kg capacity	Surface
Cap magazine		Surface
Communications System		
Leaky feeder	10 km of coaxial cable	
Pipe		
Water	HDPE 2” – 4”	
Compressed air	HDPE 2” – 4”	
Dewatering	HDPE 2” – 4”	
Paste fill	HDPE 4” – 6”	

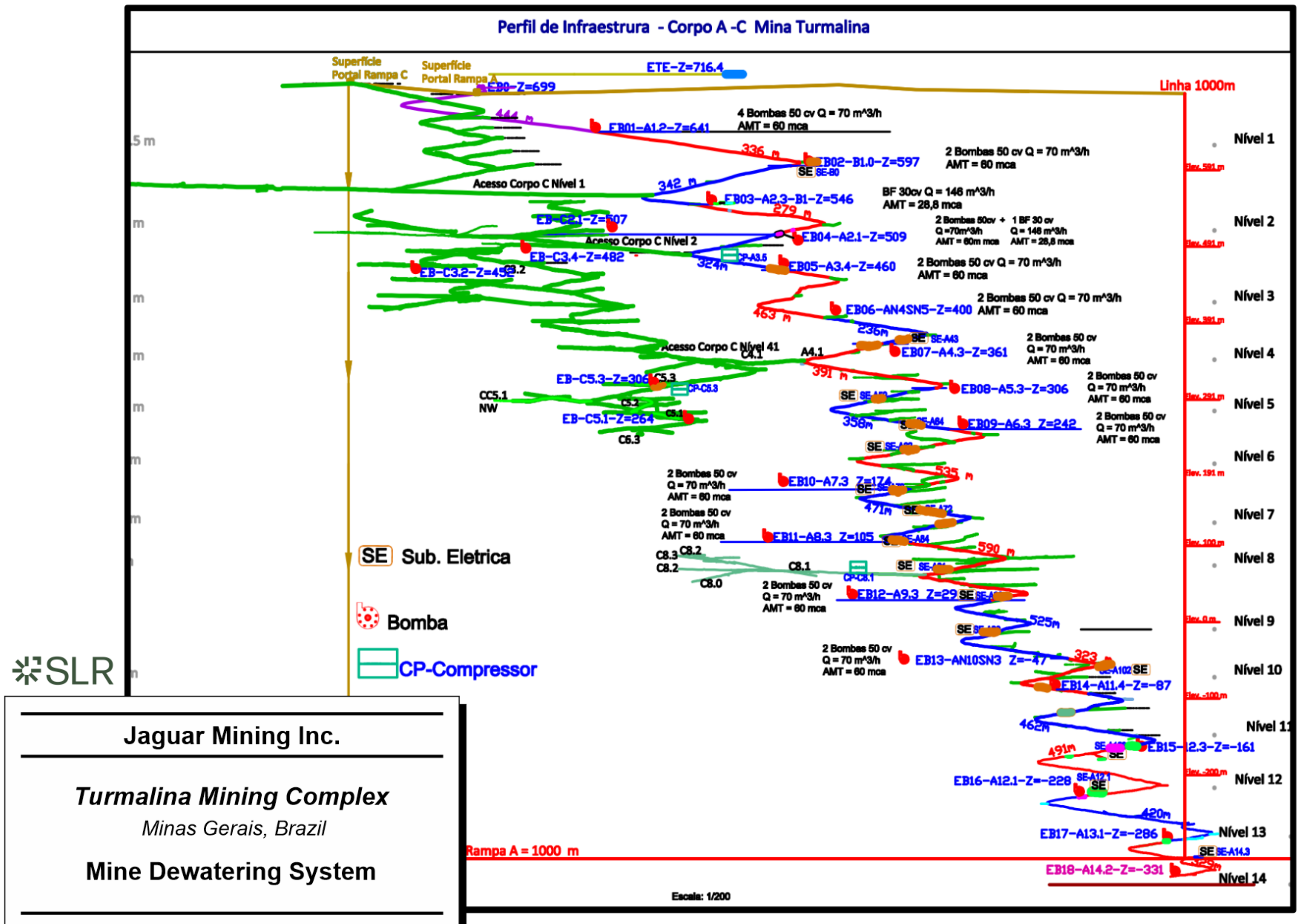
Source: Jaguar, 2022

Figure 16-15: Ventilation System



Source: Jaguar Mining Inc., 2023.

Figure 16-16: Mine Dewatering System



Source: Jaguar Mining Inc., 2023.

16.6 Personnel

Table 16-6 lists the number of Jaguar personnel and contractor employees that work at the Turmalina Mine. The contractors at the mine include Toniollo Busnello S.A. (mining contractor), Encobras (diamond drilling and truck haulage), Orica (Explosives), and Tracbel S.A. (maintenance of Volvo equipment).

Table 16-6: Personnel

Area	Number of Personnel	
	Jaguar	Contractors
Management/Supervision/Safety	51	-
Geology & Technical Services	71	35
Mine Operations	41	2
Mine Development	64	132
Mine Services	43	17
Haulage	76	2
Mine Maintenance	57	14
Other	31	60
Total	**434**	**262**

Source: Jaguar, 2023

16.7 Mine Equipment

As part of the mine expansion, new equipment will be purchased in 2025 as shown in Table 16-7. Other equipment from the mine will also be used in Faina as mining moves from one orebody to another.

Table 16-7: New Equipment

Mobile Equipment	Model	Total
Truck	Volvo FMX 500 6x4 EURO 6 (CB 16m³ e SCI)	2
LHD	Sandvik LH410 2022	1
Jumbo	Jumbo 2 BRAÇOS, JOY DR-2SB	1
Production Drill	Sandvik DL421	1
Scissor Lift	Epiroc SV 13180	1
Support Truck	TBD	1

Source: Jaguar, 2023

Table 16-8 lists the mobile mine equipment operating at the Turmalina Mine, including make and model. Some of the equipment listed belongs to mining contractor Toniollo Busnello S.A.

Table 16-8: Mine Equipment

Equipment No.	Equipment Type	Make	Model	Year	Owner	Quantity
FD21	Longhole drill rig	Epiroc	1 Boom H1257	2008	Jaguar	1
FD 37	Longhole drill rig	Epiroc	1 Boom S7D	2016	Jaguar	1
FD 38	Longhole drill rig	Epiroc	1 Boom DL 420-7C	2011	Jaguar	1
JE 23	Jumbo	Epiroc	H282	2008	Jaguar	1
JE 35	Jumbo	Epiroc	1 Boom DL 420-7C	2007	Jaguar	1
JE 36	Jumbo	Joy Global	2 Boom DR 2SB	2018	Jaguar	1
JE 37	Jumbo	Joy Global	2 Boom DR 2SB	2018	Jaguar	1
JEAL 01	Jumbo	Epiroc	Boomer H282	2012	Jaguar	1
CE 01	Explosives truck	Ford	F400 MCU	2017	Jaguar	1
CM 16	Explosives truck	Ford	Ford Cargo 1722E	2018	Jaguar	1
CM26	Boom truck	Mercedes Benz	L1618/51CC	2007	Jaguar	1
CM 27	Personnel carrier truck	Volkswagen	17250E	2006	Jaguar	1
CM 49	Articulated dump truck	Volvo	A30 E	2010	Jaguar	1
CM 51	Articulated dump truck	Volvo	A30 E	2010	Jaguar	1
CM 52	Articulated dump truck	Volvo	A30 E	2010	Jaguar	1
CM 70	Dump truck	Volvo	TRAKKER 380T/42 – 6X4	2012	Jaguar	1
CM 88	Articulated dump truck	Volvo	A30 F	2017	Jaguar	1
CM 89	Articulated dump truck	Volvo	A30 F	2015	Jaguar	1
CM 95	Dump truck	Iveco		2019	Jaguar	1
CM 99	Explosives truck	Iveco	170E21 (4X2)	2019	Jaguar	1
CM101	Dump truck	Volvo	FM 500 6X4R	2021	Jaguar	1
CM102	Dump truck	Volvo	FM 500 6X4R	2021	Jaguar	1
CM103	Dump truck	Volvo	FM 500 6X4R	2021	Jaguar	1
CM104	Dump truck	Volvo	FM 500 6X4R	2021	Jaguar	1
CM105	Dump truck	Volvo	FM 500 6X4R	2021	Jaguar	1
CMB 01	Concrete mixer truck	Mercedes Benz			Jaguar	1
CMAL23	Explosives truck				Jaguar	1
CG 42	Load-haul-dump unit (LHD)	Epiroc	ST2G	2011	Jaguar	1
CG 47	LHD	Epiroc	LHD ST14	2011	Jaguar	1
CG 48	LHD	Epiroc	ST1030	2011	Jaguar	1

Equipment No.	Equipment Type	Make	Model	Year	Owner	Quantity
CG 50	LHD	Epiroc	ST-1030	2011	Jaguar	1
CG 55	Wheel loader	New Holland	W190	2012	Jaguar	1
CG 60	Wheel loader	New Holland	W190	2012	Jaguar	1
CG 61	LHD	Epiroc	ST1030	2016	Jaguar	1
CG 63	Wheel loader	Volvo	L120 F	2018	Jaguar	1
CG 69	Wheel loader	Volvo	L120 F	2021	Jaguar	1
PT 29	Wheel loader	New Holland	W130	2011	Jaguar	1
PT 32	Backhoe loader	New Holland	B95B T	2012	Jaguar	1
MT05	Telescopic handler	JCB	540-170	2019	Jaguar	1
ES 01	Crawler excavator	Case	CX220 B	2009	Jaguar	1
ES 08	Crawler excavator	Case	CX220 C	2019	Jaguar	1
RE 11	Backhoe loader	JCB	ICX	2009	Jaguar	1
RE 22	Backhoe loader	New Holland	B95B T	2012	Jaguar	1
RE 26	Backhoe loader	New Holland	B110B T	2014	Jaguar	1
RE 33	Backhoe loader	New Holland	B95B T	2019	Jaguar	1
RE 34	Backhoe loader	New Holland	B95B T	2019	Jaguar	1
MCG 02	Slid steer loader	New Holland	L220	2012	Jaguar	1
MCG 04	Slid steer loader	New Holland	L220	2012	Jaguar	1
MN 07	Motor grader	New Holland		2012	Jaguar	1
MN 08	Motor grader	Caterpillar	120	2021	Jaguar	1
BOB 01	Slid steer loader	New Holland	4103	2009	Jaguar	1
SC 01	Scaler	RDH	BM150DEH		Jaguar	1
VL 19	Ambulance	Fiat		2007	Jaguar	1
VLAL48	Pickup truck	Toyota	Hilux CS 4X4		Rented	1
VL 55	Ambulance	Toyota		2011	Jaguar	1
VL185AL	Sedan	Toyota	Etios	2019	Rented	1
VL186AL	Sedan	Toyota	Etios	2019	Rented	1
VL187AL	Sedan	Toyota	Etios	2019	Rented	1
VL188AL	Sedan	Toyota	Etios	2019	Rented	1
VL189AL	Sedan	Toyota	Etios	2019	Rented	1
VL190AL	Sedan	Toyota	Etios	2019	Rented	1
VL191AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL192AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1

Equipment No.	Equipment Type	Make	Model	Year	Owner	Quantity
VL193AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL194AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL195AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL196AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL197AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL198AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL199AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL200AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL202AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL203AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL204AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL205AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL206AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL207AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL208AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL210AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL220AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL223AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL224AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL225AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL226AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL227AL	Pickup truck	Toyota	Hilux CS 4X4	2019	Rented	1
VL228AL	Pickup truck	Toyota	Hilux CD 4X4	2019	Rented	1
SD 02	Diamond drill	Atlas Copco	DIAMEC 252	2007	Rented	1
SD 08	Diamond drill	Atlas Copco	LM 30	2010	Rented	1
SD 13	Diamond drill	Epiroc	Diamec Smart 4	2020	Rented	1
SD 14	Diamond drill	Epiroc	Diamec Smart 4	2020	Rented	1
-	Jumbo	Sandvik	DD-320 26X		Contractor	1
-	Jumbo	Sandvik	DD-321 40-C		Contractor	2
-	Wheel loader	Volvo	L120F		Contractor	2
-	LHD	Sandvik	LH307		Contractor	1
-	Telescopic handler	JCB	TH535 125		Contractor	3
-	Mobile diesel compressor	Atlas Copco	XAS 420		Contractor	3

Equipment No.	Equipment Type	Make	Model	Year	Owner	Quantity
-	Drill wagon	Sandvik	PHW-5000		Contractor	2
-	Hydraulic breaker	Atlas Copco	SB202		Contractor	3
-	Wheel excavator	Doosan	DX53W		Contractor	1
-	Sedan	Volkswagen	Gol 1.6L HB5		Contractor	1
-	Sedan	Renault	Duster Zen 1.6		Contractor	1
-	Dump truck	Mercedes Benz	Axor 2831		Contractor	2
-	Dump truck	Mercedes Benz	Axor 3131		Contractor	5
-	Flatbed truck	Mercedes Benz	Acello 815		Contractor	1
-	Minibus	Volare	V8L 4x4		Contractor	1
-	Lubrication truck	Mercedes Benz	Atego 1518		Contractor	1
-	Backhoe loader	Caterpillar	416-e		Contractor	2
-	Pickup truck	Mitsubishi	L200 Triton		Contractor	2
-	Pickup truck	Toyota	Hilux CDLOWM4FD		Contractor	3

Source: Jaguar, 2022

17.0 Recovery Methods

17.1 Introduction

During 2021, the Turmalina Plant processed approximately 409,700 t at an average grade of 3.12 g/t Au and the overall plant recovery was 88.6%. The current mine plan includes ore from the Turmalina mine and the Faina deposit. The peak production rate in the LOM plan is 2025 and 2026 producing approximately 600,000 tonnes per year or 1,644 tonnes per day. The Turmalina plant has a nominal processing capacity of 2,000 tpd ore 720,000 tpa providing approximately 18 percent excess capacity at the planned peak production rate.

Since inception, the Turmalina Plant has been achieving annual overall recoveries of between 87% and 92%. The process flowsheet includes three-stage crushing and screening to minus 9.5 mm (-3/8 in), primary grinding, thickening, cyanide leaching, CIP, elution, electrowinning, and smelting. The tailings flow by gravity to a detoxification unit for arsenic removal and cyanide destruction and then are pumped to the paste fill plant to be used either for mine backfill or deposited on a purpose-built dry stack storage area. Process tailings have also been stored in completed open pits on the mine site. The simplified process flowsheet and the mine site plan is presented in Figure 17-1 and Figure 18-1, respectively.

The process control system comprises a conventional programmable logic controller (PLC) system based on a process control philosophy that is compatible with an online optimizing system (Advanced Control System, or ACS) in the future. The ACS entails both Expert and AI-based levels, the highest objective function being throughput. It is envisioned that a production information management system (PIMS), laboratory information management system (LIMS), and manufacturing execution system (MES) will be implemented when appropriate. The control room is located close to the hydrometallurgical plant. Three dedicated PLCs control the crushing and screening plant, the thickener, grinding plant, hydrometallurgical plant, the paste fill plant, and the Detox plant.

The current simplified flowsheet is illustrated in Figure 17-1 and is described below. A summary of the mill production history and recovery has been presented in 2 in Section 6 of this Technical Report.

17.2 Crushing and Screening

Ore mined from the Turmalina and Faina mines will be transported to the Turmalina processing plant and dumped onto ROM stockpiles in front of the three stage crushing plant. The primary crusher operates in open circuit and the secondary and tertiary crushers operate in closed circuit with their associated vibrating screens.

Ore is excavated from the ROM surge pile with a front-end loader and dumped through a grizzly into the primary jaw crusher feed hopper at a nominal rate of 140 tonnes per hour (tph). The ore is drawn from the feed hopper with a vibrating grizzly feeder. Grizzly oversize material flows into the primary jaw crusher and the crushed product and grizzly undersize are combined on the primary screen feed conveyor. The primary screen oversize material is conveyed to the secondary cone crushers and the 9.5 mm screen undersize product is conveyed to the crushed ore storage bin.

The secondary cone crushers discharge onto the secondary double deck screen feed conveyor and the material is delivered to the secondary screen. Secondary screen top deck oversized material is recycled to the secondary crushers, middle deck oversize is conveyed to the tertiary crushers and the secondary screen undersize product is conveyed to the crusher ore storage bin.

Tertiary crusher product is conveyed to the tertiary screen. Tertiary screen oversize material is recycled to the tertiary cone crushers and tertiary screen undersize is conveyed to the crushed ore storage bin.

The final product, minus 9.5 mm (-3/8 in), is stored in the crushed ore storage bin and provides grinding plant surge capacity. The crushed ore storage bin allows the crushing plant to operate at a higher rate to provide the required mill feed and allow time for routine maintenance.

17.3 Grinding, Classification and Thickening

The Turmalina Plant has been operating on Mill #3, one of three installed ball mills since 2017 to conserve energy and reduce costs. Mill #3 has a capacity of 70 tph or 1,545 tpd at 92% operating availability. Mill #3's capacity will be sufficient through 2024 of the LOM plan but a second mill may have to be run in 2025 when the production rate increases to 1,644 tpd or 75 t/h at 92% availability.

Mill #1 is 3.2 m ø x 4.7 m (10.5 ft ø x 15.5 ft) equivalent grinding length (EGL) with a maximum capacity of 25 tph and is operated by a 745 kW (1,000 HP) motor. Mill #2 is 3.8 m ø x 5.5 m (12.5 ft ø x 18 ft) EGL with a maximum capacity of 60 tph and is operated with a 1,342 kW (1,800 HP) motor. Mill #3 is 4 m ø x 6.6 m (13 ft ø x 21.8 ft) EGL with a maximum capacity of 70 tph and is operated by a 1,491 kW (2,000 HP) motor. The Turmalina Plant combined grinding capacity of all three mills is 3,400 tpd at 92% operating time and could facilitate a production expansion if required.

The feed grade to the grinding mills is determined by sampling with an automatic sampler. Material is conveyed from the surge bin to the grinding mill feed chute along with process water and reagents. Lead nitrate ($Pb(NO_3)_2$) is an oxidizer and is added in the grinding mill feed at a rate of 50 g/t to prevent excessive NaCN consumption by the formation of thiocyanides (SCN), ferrocyanides $(Fe(CN)_6)^{4-}$, and ferricyanides $(Fe(CN)_6)^{3-}$.

The grinding mill slurry discharges into the hydrocyclone (cyclone) feed pump box, from which it is pumped to a cluster of cyclones for particle size separation. The cyclone overflow slurry contains the P_{80} 74 µm (P_{80} 200 mesh) product size material and the cyclone underflow contain the oversized material which flows to the ball mill feed chute for reprocessing.

The cyclone overflow slurry flows through a trash screen and then into the 30.5 m ø (100 ft ø) leach feed thickener where flocculants are added to optimize the settling rate of the pulp. The thickener underflow, 53% solids by weight, is pumped to the pulp conditioning system of the CIP plant. The thickener is instrumented to maintain the pulp at a density of approximately 48% to 50% solids by weight. The water addition flow rate is monitored and controlled by a magnetic flow meter and pulp densitometer. The thickener overflow is directed to the process water tank as make-up water.

17.4 Leaching Circuit

The leaching circuit consists of seven agitated tanks operating in series. Lime and NaCN are added to the first tank to adjust the pH an commence the leaching process. If required the first tank can be used for sulphide preoxidation, adding oxygen or air and lime. NaCN would then be added in the second tank to begin the leaching process. Lead nitrate is an oxidizer which is added in the grinding circuit to prevent excessive NaCN oxidation and consumption. Compressed air is injected in the bottom of all the tanks at a rate of 0.94 m^3/s and at a pressure of 3.5 kg/cm^2, as the process consumes large amounts of oxygen. The residence time in the leaching circuit is approximately 25 hours.

17.5 Adsorption Circuit

The carbon in pulp (CIP) adsorption circuit is conventional. The gold bearing pulp passes through five agitated adsorption tanks arranged in series. Activated carbon with a size range of 2.4 mm to 1.19 mm and a minimum pulp concentration of 20 g/L is added to the last in the series of tanks and is pumped from tank to tank in the opposite direction from the slurry flow. Thus, the carbon adsorbs the gold from the pulp as the process continues. When the adsorption cycle is completed, approximately ten hours, the loaded carbon, containing approximately 1.5 kg of gold per tonne of carbon, is pumped from the first tank in the series to the elution and electrowinning circuit.

17.6 Elution and Electrowinning

The loaded carbon is pumped to the 28 mesh loaded carbon screen. The screen undersize slurry is redirected back to the adsorption circuit. The screen oversize carbon feeds the elution circuit. The elution circuit comprises four columns operating in batch mode, two of which are stripping while the other two are loading. The estimated carbon load in each column (1.25 m in diameter and 6.25 m high) is approximately 2.7 t. Loaded carbon is eluted using a 1% w/w caustic soda solution plus 200L of ethyl alcohol per batch. The eluant is heated to 95°C and pumped into the elution columns from bottom to top. The rich eluant is stored in an electrowinning circuit feed tank, with the tank overflow feeding the electrowinning circuit. The electrowinning circuit consists of six cathodes and seven anodes, energized with a 360 A current and a voltage of 3.5 V to 4.0 V. The Au precipitates onto the cathodes forming a precious metals rich sludge. The sludge is cleaned from the electrowinning cells with high pressure sprays, filtered, and dried and smelted in a furnace to produce precious metal doré ingots for sale.

Jaguar currently ships the electrowinning sludge to a third party for smelting and refining.

17.7 Acid Washing

The activated carbon first undergoes a stripping process in the elution columns, where the adsorbed gold is removed by a 1% (by weight) NaOH solution at 95°C. It is then conveyed to a surge tank via an ejector directed towards a 28 mesh screen for the removal of fines (undersize). The screen oversize is conveyed to an 8 m^3 fibreglass acid washing tank. Acid washing is necessary to maintain the loading capacity of the activated carbon since the mineral matrix possesses other cations such as calcium, iron, copper, zinc, and lead that compete with gold in the interstices of the activated carbon. The acid washing is completed by passing an acid solution of 10% HCl through the tank, removing the impurities that diminish the capacity of the carbon to adsorb gold, mainly carbonates and base metals.

The acid solution of HCl at 10% (by weight) is prepared in a fibreglass HCl solution tank by adding water and HCl at 33% by weight. This solution is injected at the bottom and discharged at the top of the acid washing tank by overflow, returning to the HCl solution tank by gravity. The time involved in the acid washing is approximately 16 hours.

Once acid washing is completed, the acid solution is drained towards a neutralization tank. The carbon will be neutralized with a 1% (by weight) NaOH solution using a procedure identical to the one used for the acid solution. The neutralization time ranges from one to two hours, depending on the pH control of the recycled solution. The remaining solution is also drained to the neutralization pond. Thereafter, the carbon is washed with water in an open circuit with regards to the neutralization pond. This operation lasts approximately two hours. After these stages, the carbon is transferred to the 28-mesh screen and can be conveyed to the carbon addition circuit in the volumetric control vessel, and then to the last adsorption tank in the CIP circuit. A furnace is not employed for carbon regeneration as the expected performance in regeneration was not successfully achieved.

17.8 Detoxification Plant

The CIP adsorption tank tailings (86 tph at 42% solids) are conveyed by gravity to a belt screen to avoid carbon loss and then to a tailings pulp treatment plant (TPTP or Detox plant) and then to the filter and paste fill plant. Caro's acid (a mixture of concentrated sulphuric acid and hydrogen peroxide) is used in the Detox plant for cyanide destruction.

17.9 Filter and Paste Fill Plant

The treated tailings from the Detox plant, a pulp at 42% solids by weight, are conveyed to a pumping station where they are sent by rubber lined centrifugal pumps (75 HP – one operating and one standby) to the filter and paste fill plant, which is located about one kilometre away from the pumping station. The slurry is received in a pulp storage tank, from which it is pumped to a hydrocyclone cluster, and the overflow feeds a thickener. The cyclone underflow, together with thickener underflow, feeds three drum filters (3.0 m ø x 4.9 m, 10 ft ø x 16 ft). The filtration process generates a cake and a filtrate (liquid phase). The thickener overflow is recycled to the industrial water tank for process water. The filtrate, less than 3% of the total tailings, as ultra-fines is pumped to the tailings dam for polishing and water management.

The cake from the filters, after having gone through the stages of the filtration cycle (cake formation, washing, drying, blow, and discharge), contains approximately 30% moisture. The filter cake is either conveyed to the paste fill circuit or transported by truck and placed in a dry stack filtered tailings storage facility if it is not needed for mine backfill.

The filter cake conveyed to the paste fill circuit is used for cemented underground paste backfill. It is conveyed with a 914.4 mm (36 in) wide x 27 m long conveyor belt to the cake preconditioning hopper, after which the cake is sent to the weigh hopper where additives such as Portland cement or, alternatively, "Fosbinder" are added in proportion to the cake mass flow. Other binders aimed to impart structural properties to the paste, as well as to neutralize excess acidity due to the binders high carbonate content, can also be added. The cake is then directed to the paste mixer for the final paste production. The paste is then used as fill in the underground mine.

The paste fill plant uses a batch process, which allows better control of the paste characteristics for backfill than a continuous process.

17.10 Energy, Water, and Process Materials Requirements

Power requirements for the processing facilities are not anticipated to change significantly in the foreseeable future from the current annual energy requirements (approximately 51,200 MWh).

Water consumption is not expected to change significantly from the recent historical water usage (1.94 million m^3) and no supply concerns have been noted.

Key reagents used in the process include hydrated lime, cyanide, caustic soda, hydrochloric acid, sulphuric acid, liquid oxygen, and hydrogen peroxide.

The annual reagent consumptions are presented in Table 17-1.

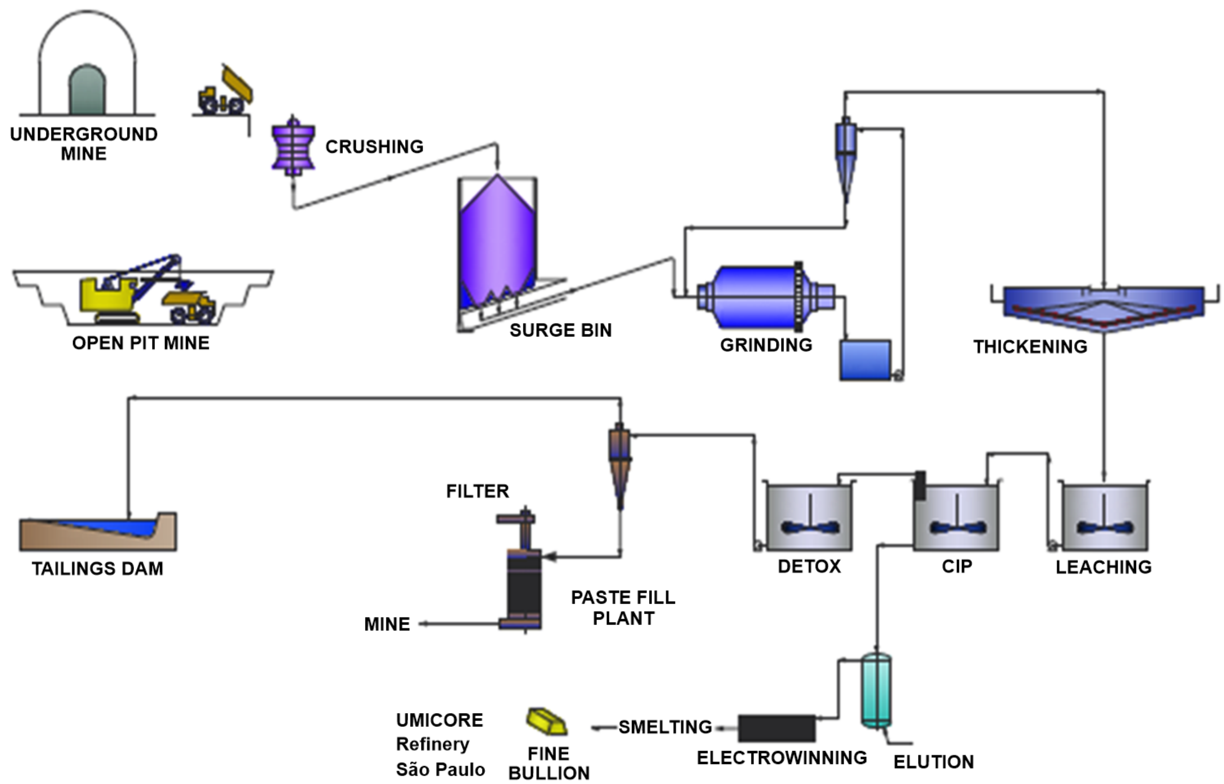
Table 17-1: Annual Reagent Consumptions

Reagent	Units	Quantity
Grinding media	t	613
Hydrochloric acid	kg	172,540
Caustic soda	kg	46,725
Sulphuric acid	kg	348,559
Lead nitrate	kg	5,200
Carbon	kg	22,000
Sodium cyanide	t	689
Liquid oxygen	m3	1,038,273
Hydrated lime	t	469
Hydrogen peroxide	kg	324,789
Flocculant	kg	6,475

17.11 Manpower

The total number of Plant personnel is 100 (60 plant and 40 maintenance).

Figure 17-1: Process Flowsheet



Jaguar Mining Inc.

Turmalina Mining Complex
Minas Gerais, Brazil

Process Flowsheet

Source: Jaguar Mining Inc., 2023.

18.0 Project Infrastructure

18.1 Access Roads

The Turmalina Mine, Turmalina Plant, and the satellite deposits, Faina, Pontal, and Zona Basal, are accessible by service roads and the national highway system.

18.2 Power

Electrical power is obtained from the national grid.

The MTL Complex includes the Turmalina Plant, with a nominal capacity of 2,000 tpd, and tailings disposal area.

18.3 Water

Water and sewer access for the Turmalina Mine and Turmalina Plant are via the local system.

18.4 Buildings On Site

Ancillary buildings located near the mine entrance include the gate house with a reception area and waiting room, administration building, maintenance shops, cafeteria, warehouse, change room, first aid room, and compressor room. The explosives warehouse is located 1.2 km away from the Turmalina Mine area, in compliance with the regulations set forth by the Brazilian Army. There is no camp at the Turmalina Mine site.

Additional ancillary buildings are located near the Turmalina Plant and include an office building, a laboratory, warehouse, and a small maintenance shop.

There is no infrastructure related to the Faina and Pontal historic open pit operations.

18.5 Tailings

All tailings are either dry stacked on surface or used as cemented paste fill underground. A tailings storage facility, which includes a dam, was in use until September 2021, and is now in the process of closure.

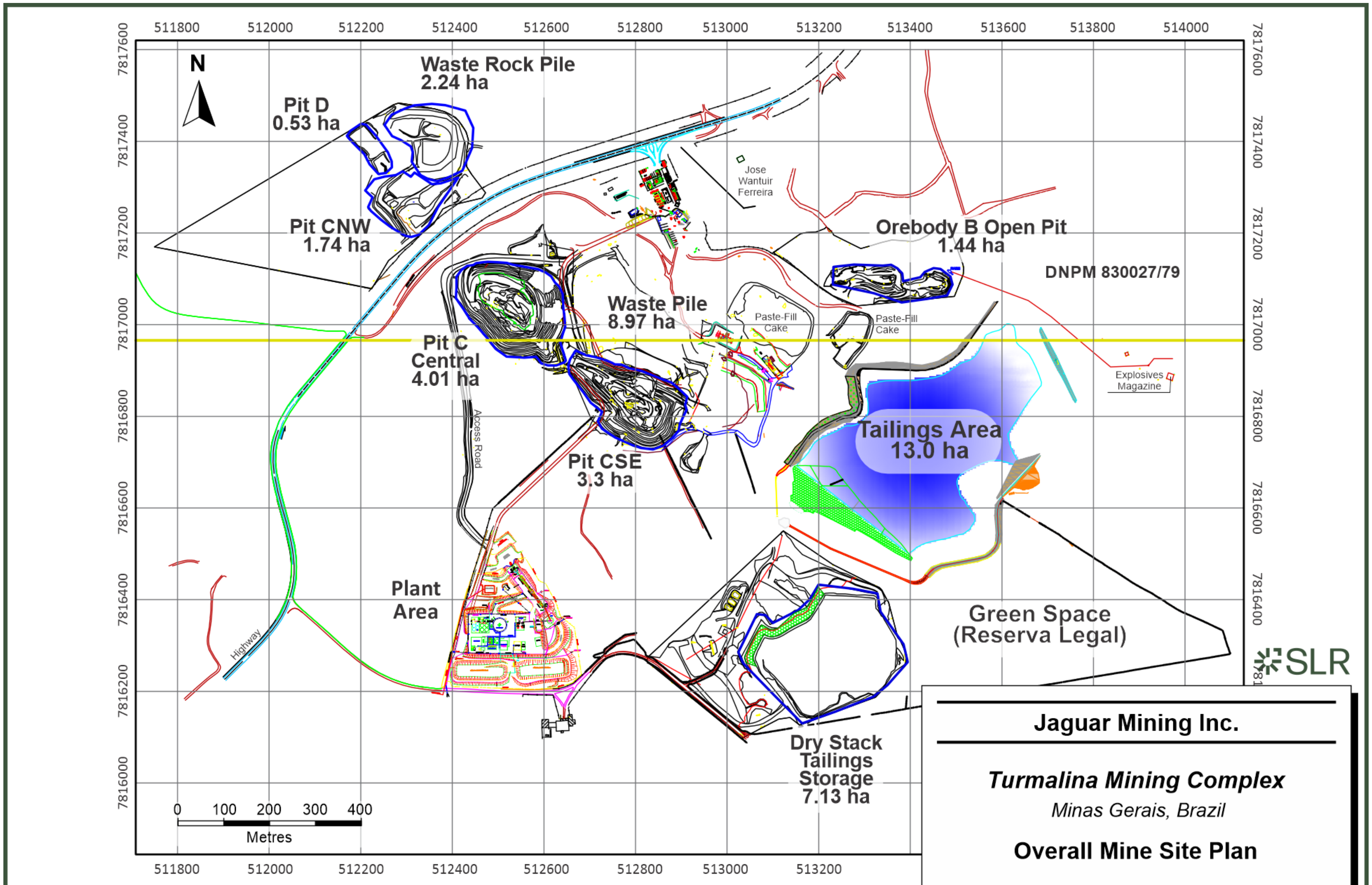
The upper portion of the central Orebody C was mined using the open pit method, which is now complete. Part of the mine surface area does not belong to Jaguar. The benches were designed to have a slight incline (1.0%) from slope crest to toe to allow drainage of storm and ground water. Benches between elevations 750 m and 720 m also had an incline of 1% to their toes at the natural ground level. Below elevation 720 m, sumps were constructed to collect all ground and storm water, which was then pumped to the mine's water treatment system. Orebody C is currently being mined using SLOS. Underground mining of Orebody C was fully integrated with the remainder of Turmalina's underground mining operations, including the opening of a ramp and access drifts to the bodies from the main decline. After being mined, panels are filled with paste fill from the current Turmalina paste backfill plant. This underground method is considered to be favourable from an environmental impact perspective, since placing paste backfill in the stope panels reduces the requirement for surface tailings storage.

The tailings system is a single downstream step with a full capacity of 790,682 m^3. The detailed engineering for the tailings disposal system was completed by the local consulting company Engeo Ltda (ENGEO). All tailings are first detoxified in a Caro's acid detoxification plant (CyPlus technology – “cold”). The detoxification plant was constructed by EVONIK in Mobile, Alabama, USA. The process was conceived by CyPlus, a Degussa technology company that specializes in the application of peroxide, SO_2, and/or Caro’s acid to detoxify cyanide residue and arsenic from the tailings of gold processing plants. The selected treatment uses Caro’s acid as a reagent to promote the decomposition of cyanide to cyanate and to reduce the concentration of arsenic in the tailings that will be used in the production of the paste fill. In order to generate Caro’s acid, concentrated sulphuric acid is mixed with 50% oxygenized water in a Teflon/stainless steel reactor. Caro’s acid promotes the oxidation of cyanide to cyanate, and cyanate is considered to be 1,000 times less toxic than cyanide. The cyanate then decomposes into carbon dioxide and ammonia by hydrolysis. Caro’s acid acts with efficiency to eliminate arsenic while in solution, causing the oxidation of As(III) to As(IV); As(IV) is easily precipitated with ions from iron, calcium, and magnesium. Under these conditions, the used metal becomes immobilized in the paste fill, neither interacting with the environment nor undergoing any type of leaching being dissolved by the underground water or by rainfall (if the paste is not contained and piled outside). After the detoxification process, the pulp is sent to two 0.25 m (10 in.) cyclones, where it is either thickened to make paste fill or, if there is no current need for paste, sent to the tailings disposal system. When required for use as backfill, the cyclone underflow from the Turmalina Plant, with 70% solids, is used in the production of the paste fill and then returned to the mine as fill to the mining stopes. The overflow, with fine solid particles and the majority of the water, is thickened and also used in the production of the paste fill. In the event of a temporary malfunction of the process, the referred material is sent to the emergency chambers or to the tailings disposal system. The detoxified solution, separated from the tailings, is then recirculated for use in the Turmalina Plant, thus closing the circuit for the process water. MSOL/Jaguar stopped the hydraulic release of tailings at the Turmalina dam on September 27, 2021, with the shutdown and inactivation of the Usina-Dam transport line, and with the activation of the pumping line for the Usina-Pond, a reactivated pond located inside the beneficiation plant.

A new waste stockpile has been designed for waste rock storage adjacent to the existing Turmalina waste stockpile. It has the same configuration as the existing stockpile, with a bench height of 10 m, bench width of 5 m, slope face angle of 30°, and overall stockpile angle of 26°.

The overall site layout for Turmalina is presented in Figure 18-1.

Figure 18-1: Overall Mine Site Plan



Source: Jaguar Mining Inc., 2023.

19.0 Market Studies and Contracts

19.1 Markets

Gold is the principal commodity at the MTL Complex and is freely traded at prices that are widely known, so that prospects for sale of any production are virtually assured. A gold price of $1,650/oz Au was used for estimation of Mineral Reserves and for the economic analysis.

19.2 Contracts

The SLR QP reviewed recent costs for transportation, security, insurance, and sales of doré, and considers them to be within industry norms.

20.0 Environmental Studies, Permitting, and Social or Community Impact

The information presented in this section is based on documentation provided by Jaguar, information on the company website.

The Jaguar 2020 Sustainability Report states that the company is committed to comply with law, guidelines, including the International Finance Corporation's (IFC) Performance Standards Performance Standards on Environmental and Social Sustainability, United Nations Policy Framework for Business and Human Rights), AA1000 Stakeholder Engagement Standard 2015 (Accountability), Sustainable Development Goals (SDG), United Nations Development Program (UNDP), and Global Reporting Initiative (GRI) Guidelines.

The company has an Environmental and Social Governance Framework and several supporting policies such as a Risk Management Policy (2022), Compliance Policy (2023), Code of Conduct and Ethics Policy (2023), Anti-bribery and Corruption Policy (2023), and a Whistleblower Policy (2023).

Jaguar also has an Environmental Management System with procedures for obtaining authorisations, auditing and inspections, amongst others.

20.1 Environmental Studies and Environmental Issues

Environmental studies pertaining to acid rock drainage (ARD) potential have been carried out as requested by the National Environmental and Sustainable Development Agency (SUPRAM for its acronym in Portuguese), on Operation Licence ('Licença de Operação', or LO) 012/2008. These studies continued from 2007 through 2017. In February 2018, Galapagos Consultoria Ltda issued a specialized report, which indicated low ARD potential for the mined material due to the low concentration of sulphides and the presence of compounds with neutralization potential, such as carbonates (Galapagos, 2018). However, the study also indicated arsenic leaching potential and, as a result, Jaguar initiated a contamination plume investigation. Jaguar has officially informed SUPRAM about the arsenic leaching potential. In 2021, the company Hidrogeo issued a new report updating water monitoring information and new tests for the material in the tailings pile. In 2022 Jaguar installed eleven new piezometers to monitor groundwater and quality analyzes are carried out every three months, and five more piezometers were installed in 2023.

In 2021, Jaguar developed the "Environmental Performance Assessment Report" as a way to confirm if all the Turmalina operation controls and required best practices were being completed and supervised in accordance with the legal standards.

In January 2024, Jaguar indicated that there have been no changes to the way the company identifies and manages environmental and social risk. Jaguar did identify one non-compliance issue when water was abstracted from the Para River in December 2022, which was resolved when a permit for abstraction was obtained in December 2023. The non-compliance and corrective action tracking was recorded in the Environmental Management system.

In January 2024, Jaguar also indicated that there have been no non-compliance issues at the mine since 2022 and that the operation continues to conduct environmental monitoring in accordance with permit requirements.

Since Jaguar acquired the Pitangui property in September 2023, no environmental studies have been completed on this property. The property is a greenfields site with no history of previous mining. The property is rural and characterized by rolling terrain with a mix of forest and farmland (SRK, 2021).

20.2 Project Permitting

20.2.1 Original Turmalina Project Licenses

In 2005, Jaguar applied for a Preliminary Licence (‘Licença Prévia’, or LP) related to the original Turmalina Gold Project, for both the open pit and underground exploitation of the sulphide mineralized body on Mining Concession ANM 812.003/75 and the mineral processing plant. LP 078/2005 was granted to Jaguar in October 2005. Along with the LP application, an environmental study was submitted which formed an Environmental Control Report (‘Relatório de Controle Ambiental’, or RCA). In November 2005, Jaguar applied for an Installation Licence (‘Licença de Instalação’, or LI) for the Turmalina Gold Project. In August 2006, COPAM, the State Environmental Policy Council, granted Jaguar the LI (LI 114/2006) upon review of the Environmental Control Plan (‘Plano de Controle Ambiental, or PCA). An Operation Licence for the Turmalina Gold Project was applied for in February 2007 and was granted in June 2008 (LO 012/2008).

Jaguar applied for and received the revalidation of the LO in March 2012, renovating all the operations at the Complex, including the tailings disposal system, the Turmalina Plant. In 2023, Jaguar obtained an updated permit to pump water from the Pará River. A list of the existing permits is presented in Table 20-1 and Table 20-2.

Jaguar confirmed that the operations holds all the required environmental approvals and permits in January 2024.

Table 20-1: List of Existing Operating Licences

Enterprise	Certificate Number	Process Number (PA COPAM)	ANM	Granting Date (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Observation
Plant, waste pile, open pit and underground mine	LO 012/2008	01154/2005/003/2007	812.003/1975	19/06/2008	19/06/2012	This licence is in revalidation process since 2012 (PA COPAM 01154/2005/012/2012).
Tailings dam	LO 012/2009	01154/2005/008/2009	812.003/1975	17/12/2009	17/12/2013	This licence is in revalidation process since 2012 (PA COPAM 01154/2005/012/2012).
Expansion Project – plant, waste pile, open pit and underground mine	LOC 076/2009	01154/2005/007/2009	812.003/1975	17/12/2009	17/12/2013	The LOC 076/2009 improved the first licence (LO 012/2008). This licence is in revalidation process since 2012 (PA COPAM 01154/2005/012/2012).

Note:

1. Application to renew these permits has been submitted; renewal approvals are pending.
2. Some complementary information was requested by SUPRAM and has been supplied by Jaguar environmental personnel. According to the law (Deliberação Normativa COPAM 17/1996) the licences remain valid.

Table 20-2: List of Water Use Licences

Grant Date (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Procedure Number	Process Number	Watercourse	Permitted Rates	Status	Revalidation
7/19/2023	10/19/2032	1204222/2023	20516/2023	Surface water Pará river	28.3 L/s	Valid	N/A
10/10/2020	10/10/2030	1207694/2020	13594/2017	Lowering water	470.9 m^3/h	Valid	13594/2017
8/27/2019	8/27/2024	1207435/2019	11549/2014	Water Well	4.6 m^3/h	Valid	01129/2009

20.2.2 Expansion Project Licenses

Minas Gerais State Decree 44.844/2008 of June 25, 2008, states that given the operating situation and production status at the Turmalina Mine, Jaguar was allowed to apply directly for an LO for the Expansion Project, which was granted in December 2009 (LO-C 076/2009). To be able to start the development works at the Expansion Project, Jaguar applied for an Environmental Authorization for Operation (AAF), as reported below. In April 2008, Jaguar applied for two AAFs, one for underground and the other for open pit operations in Orebody C, located on ANM 803.470/1978. The AAF for the underground operations was granted by SUPRAM in September 2008 (AAF 04524/2008) and the AAF for the open pit was granted in January 2009 (AAF 00001/2009). For the open pit operations at Faina, located on ANM 812.003/1975, an AAF was applied for in September 2009 and granted by SUPRAM in June 2010 (AAF 01822/2010). The AAFs for an open pit mine allow for the mining of 50,000 tpa at each of Orebody C and Faina, while the AAF for an underground mine permits mining of 100,000 tpa. An LP and LI for the Expansion Project was applied for in November 2009, and granted in February 2011 (LP+LI 001/2011). In June 2013 the open pit operations at Faina were suspended.

Since Jaguar acquired the Pitangui property in September 2023, no environmental authorization applications have been compiled or submitted yet.

20.2.3 Turmalina Expansion Tailings Disposal System Licences

Tailings disposal is described in Section 18.5 of this report.

Jaguar applied for an LI for the tailings disposal system in November 2007, along with the Environmental Impact Assessment/Report of Impacts on the Environment (EIA/RIMA) and the PCA. The application and pertinent documents were reviewed by SUPRAM, and LI 005/2009 was granted in August 2009. The LO for the tailings disposal system operations was applied for in September 2009 and granted in December 2009 (LO 012/2009). All dams are inspected internally and by an external geotechnical consultant. There are semi-annual external geotechnical stability inspections done by an external geotechnical consultant. The 2022 and 2023 semi-annual safety inspection reports concluded that the dam is physically stable, however the reports did make some recommendations regarding ongoing maintenance. The 2022 report noted that the overflow channel had been completed to ensure hydraulic safety to accommodate the maximum probably precipitation event (Geohydrotech, 2022).

SLR relies on the conclusions of the Dam Projectos de Engenharia (2022, 2023), GeoHydroTech Engenharia (2022) and WALM Engenharia (2023) dame safety inspection and audit reports and provides no conclusions or opinions regarding the stability of the listed dams and impoundments.

20.3 Social or Community Requirements

The Turmalina operations are located close to the border of the municipality of Conceição do Pará in the central western part of the state of Minas Gerais, near the town of Casquilho and Pitangui. No Indigenous communities have been identified in the Project area and surrounds.

Casquilho's community is a district of Conceição do Pará and is in the area that is directly impacted by the operations. There are limited infrastructure services available in the town of Casquilho, due to its size. Services are sourced from Pitangui, located 15 km from Conceição do Pará.

State road MG 423 divides Casquilho's community into Casquilho de Baixo (lower Casquilho) and Casquilho de Cima (upper Casquilho), with a total population of 130 families. The majority of the

Casquilho de Cima houses are permanently occupied and most residents work in Pitangui. Only five houses are used as weekend properties.

Casquilho de Cima's community is supplied with water and power by the state-run companies Copasa and Companhia Engergetica de Minas Geraise S. A. (CEMIG). The community does not have any sanitation sewage system. Traditional sanitation holes/ditches, typically built in the backyards, are used. No additional public services are available to the Casquilho de Cima residents.

Jaguar maintains relationships with the surrounding communities. The company has an Institutional and Community Relations Team, who are responsible for identifying, enhancing, and monitoring stakeholder relationships. This team implemented a Stakeholder Management System (SGS) in 2021. The company developed an Institutional and Community Relationship Plan to address planning, control, and monitoring through a Stakeholder and Reporting Management System. The company has also been developing indicators to measure performance in the social area and impacts of company actions. These indicators are linked to the Sustainable Development Goals (SDG) (Jaguar, 2020). The 2020 Sustainability Report lists actions taken in the areas of stakeholder mapping and characterization, "social listening" in areas of influence, analysis of scenarios of risks, relationships with key stakeholders, meetings and reporting (Jaguar, 2020).

Jaguar reports that the company holds periodic meetings with institutions and communities, where themes/subjects of collective interest are presented. Representatives from different sectors of the company participate. In addition, the company arranges visits to operations. The community can make complaints, ask questions or requests to the Institutional and Community Relations Team, directly using the team's corporate cell phones and in frequent meetings and visits carried out with the communities. All of these complaints, queries and requests are documented in the SGS.

The company established the "Seeds of Sustainability" program in 2017 which funds a variety of social and cultural projects, environmental education initiatives, annual social events, and career development opportunities. The 2020 Sustainability Report indicated that nine community projects were active in 2020 and estimated that the projects have impacted the lives of approximately 2,500 people (Jaguar, 2020). The company also kicked off a Volunteering Program in 2020 with employees and contractor employees working on campaigns aimed at donating books and educational material and recreational games, donating of clothing and blankets, amongst others. In 2020, the company used tax incentives to donate money to the health system in the municipality. The Sustainability Report indicates social investments of US $ 272,777 in 2020 which focused on health and sanitation, education and culture and income generation (Jaguar, 2020).

In January 2024, Jaguar provided more information and indicated that the Seeds of Sustainability project was restructured in 2022 to comply with the Environmental Education Terms of Reference applicable to licensing requests filed with environmental agencies. This project now creates opportunities for residents of communities close to company operations to develop new skills and initiatives through socioeconomic and cultural development courses. These courses last seven months and the content is determined through surveys that are carried out annually in the communities. Some examples include technology training, craft training, entrepreneurship, and sales strategies.

Since Jaguar acquired the Pitangui property in September 2023, no social studies or engagement have yet been initiated. Jaguar will need to develop and implement a plan to obtain surface rights for the Pitangui Project, this land is understood to be privately owned and there is no process for land expropriation under local laws (SRK, 2021).

No information was available on archeological or cultural heritage resources at the time of writing this report. The mine does not have a Chance Finds Procedure.

20.4 Mine Closure Requirements

Six months before the mine is exhausted, Jaguar must submit the Mining Closure Plan (‘Plano de Fechamento de Mina’, or PAFEM) to SUPRAM for approval, according to the “Deliberação Normativa COPAM nº 220/2018”. This regulation also enforces that all mining activities in the state of Minas Gerais include the rehabilitation plan of disturbed areas.

In 2021, Jaguar developed the internal procedures for the “Mined Areas Management (PGS-MA-23.7-JAG)” plan This initiative (and its main document) compiled all the current legislation and defined the steps and necessary actions to maintain suspended areas in good standing, to make all the necessary recovery works, and to shut down the mining operations accordingly in the future. The company Brandt was contracted to develop the Closure Plan for all the mining rights belonging to Jaguar until 2024 and to review the Asset Retirement Obligation (ARO).

The actions and steps for the environmental recovery of the areas impacted by mining activity were adopted when the LI was granted and will continue until after the mine is exhausted.

The recovery of the surface areas will follow the following steps:

1. Removal and stockpiling of the fertile soil layer
2. Waste and backfill paste disposal
3. Rehabilitation of the mined areas
4. Topographical stabilization
5. Re-vegetation of the impacted areas, mainly those resulting from open pit mining
6. Rehabilitation of drainage ditches, retention sumps etc.

The following actions will be required with regard to the underground mine:

- Gradual refill of the exhausted panels
- Obstruction of the initial 50 m of the ramp with waste, to be stockpiled near the mine entrance in advance
- Construction of a cut at the mine entrance at an inclination of 35° to fill the opening created during the mine entrance development with the removed material. It will be completely filled, and the cut and fill re-vegetated.
- Obstruction of the entrances to the ventilation and emergency raises with a 10 m deep reinforced concrete wall. This will be done with waste material, to be stockpiled for this purpose in advance. The related surface areas will be re-vegetated.

Jaguar will need to develop a closure plan for the Pitangui property in due course.

20.4.1 Turmalina Dam Closure

Jaguar started the closure process for the Turmalina tailings dam in 2021, and total closure is planned for 2027. The closure project was developed by the Geohydrotech Engenharia, and was divided into three stages as follows:

- Stage 1 – install tailings cover (waste rock and HDPE geomembrane) and construct the spillway

- Stage 2 – place soil on top of the cover, construct the drainage channels and revegetate
- Stage 3 – construct the perimeter channel and widen crest

In 2021, Jaguar completed recontouring of the tailings surface and installation of the HDPE geomembrane to limit water infiltration. A spillway with capacity to convey the peak flow resulting from the 10,000 year return period event was constructed.

As of December 31, 2021, Jaguar estimated rehabilitation and reclamation costs to be US$7.08 million, on an undiscounted, uninflated basis as shown in Table 20-3.

Table 20-3: Progressive Rehabilitation and Closure Cost Estimates

Description	2023	2024	2025	2026	2027	2028	2029	Total
Waste Pile	82	74	340	165	47	21	9	761
Pit	11	8	0	0	0	0	0	42
Dam	311	0	0	0	0	0	0	4,425
Infrastructure	9	0	189	137	26	15	7	390
Plant	0	6	163	367	19	11	6	571
G&A	32	28	80	78	30	38	63	349
Contingency	33	28	189	205	30	19	19	546
Total (US$)	**479**	**145**	**960**	**952**	**152**	**103**	**104**	**7,083**

Notes:

1. Numbers may not add due to rounding.
2. No inflation or discount factors applied.

21.0 Capital and Operating Costs

The MTL Complex LOM capital and operating costs were estimated in R$ based on recent operating results and Jaguar's budgets. The amounts were converted to US$ using an exchange rate of R$5.20 : US$1.00 for 2023. Most costs are not allocated to one orebody, optimization of costs are possible if costs were associated with all orebodies.

21.1 Capital Costs

Jaguar is investing new capital into the Faina deposit as well as continuing to invest in the main Turmalina orebodies. The following sections provide information on the sustaining and non-sustaining capital for MTL.

Table 21-1 provides the average unit capital costs used in the cut-off grade analysis.

Table 21-1: Average Unit Capital Costs Used in the Cut-Off Grade Analysis

Cost Category	US$/t
Primary Development	24.51
Exploration / Brownfield	1.77
Equipment / Engineering	7.98
Reclamation/Closure (ARO)	3.81
Non-Sustaining	16.51
Total Capital Costs	**54.59**

Source: Jaguar, 2023

21.1.1 Sustaining Capital

The sustaining capital cost estimate for the Turmalina Mine and Faina operation includes exploration costs and sustaining capital in the Turmalina Plant, totalling US$4,824 million from 2023 to 2027. Table 21-2 presents the annual sustaining capital costs for the MTL Complex.

Table 21-2: Sustaining Capital

Cost Area	Item	Units	2023	2024	2025	2026	2027	Total
FAINA	Infill Drilling / Exploration	US$ 000	200	500	500	500		1,700
MTL	Plant Sustaining	US$ 000		602	519	387	316	1,824
MTL	Infill Drilling	US$ 000	200	500	500	500		1,700
Total		**US$ 000**	**400**	**1,602**	**1,519**	**1,387**	**316**	**5,324**

21.1.2 Non-Sustaining Capital

The majority of the non-sustaining capital will be used to implement the Faina mining operations, including new underground equipment for development and production and ventilation fans to increase the flow in the mine and direct air to Faina. The Turmalina Plant will purchase new equipment and pipe for the tailings dry stack. Table 21-3 and Table 21-4 provide a summary of the non-sustaining capital costs for Turmalina Mine and the Faina expansion.

Table 21-3: New Equipment

Mobile Equipment	Model	Unit Cost (US$ 000)	Total Units	Total Cost (US$ 000)
Truck	Volvo FMX 500 6x4 EURO 6 (CB 16m³ e SCI)	285	2	569
LHD	Sandvik LH410 2022	1,286	1	1,286
Jumbo	Jumbo 2 BRAÇOS, JOY DR-2SB	1,469	1	1,469
Production Drill	Sandvik DL421	1,624	1	1,624
Scissor Lift	Epiroc SV 13180	204	1	204
Support Truck	TBD	87	1	87
Total			**7**	**5,238**

Table 21-4: Non-Sustaining Capital

Cost Area	Item	Units	2023	2024	2025	2026	2027	2028	Total Cost
FAINA	Mine Equipment Acquisitions	US$ 000			5,238				5,238
FAINA	Ventilation System	US$ 000		1,336	1,408				2,744
FAINA	Plant Adjustments for Faina (Filtration/CIL/stockyard) [1]	US$ 000		1,465	8,374				9,838
MTL	Plant Sustaining	US$ 000		602	519	387	316		1,823
MTL	New Tailing Pile	US$ 000		962	2,885	962	2,885		7,692
MTL/Faina	ARO	US$ 000	1,000	3,008	982	381	381	952	6,704
Total		**US$ 000**	**1,000**	**7,373**	**19,406**	**1,730**	**3,582**	**952**	**34,039**

Notes:

1. Plant adjustments under review.

21.2 Operating Costs

Table 21-5 presents the estimated LOM operating costs for Turmalina in US$. Operating cost estimates include mining, processing, and general and administration (G&A). There are additional corporate overhead costs associated with the Belo Horizonte and Toronto offices, as well as royalties and refining costs, which are not included in the operating cost estimate.

Table 21-6 presents the unit operating costs that were used in the cut-off grade analysis and to calculate the values in Table 15-2 Cut-Off Grade Data. Operating costs are estimated as the unit costs multiplied by the tonnages in the LOM production schedule in Section 16 of this Technical Report.

All-In Sustaining cost (as defined by the World Gold Council) for the Turmalina Mine is $ US$1,012.42/oz Au, including reclamation and closure.

Table 21-5: Life of Mine Operating Costs

	Units	Total	2023	2024	2025	2026	2027	2028
Mining (Underground)	US$ 000	$104,474	$7,323	$18,203	$25,314	$25,391	$24,889	$3,355
Processing MTL	US$ 000	$49,620	$5,101	$11,586	$11,805	$11,717	$7,904	$1,507
Processing Faina	US$ 000	$29,179	$-	$1,380	$7,344	$7,523	$11,887	$1,046
G&A	US$ 000	$17,478	$1,225	$3,045	$4,235	$4,248	$4,164	$561
Total Operating Cost	US$ 000	**$200,752**	**$13,649**	**$34,214**	**$48,698**	**$48,879**	**$48,844**	**$6,469**

Source: Jaguar, 2023

Table 21-6: Unit Operating Costs

Cost Area	US$/t Milled
Mining	
Labour	14.53
Maintenance	9.36
Labour / Maintenance / Other	23.89
Electricity	1.98
External Services	6.00
Mining Materials	10.39
Subtotal Mining	**42.26**
Processing	
Labour	5.32
Maintenance	2.16
Electricity	4.62
External Services	4.41
Plant Consumables (MTL/Faina)	12.61 / 20.27
Refinery	0.31
Subtotal Processing	**29.44 / 37.09**
G&A	7.07
Total (MTL/Faina)	**78.77 / 86.42**

Source: Jaguar, 2023

22.0 Economic Analysis

The MTL complex is an operating producer of gold. The mine is profitable with a pre-tax free cash flow of US$ 115.8 million dollars and after tax free cash flow of US$101.9 million dollars based on a six year mine life.

22.1 Economic Criteria

22.1.1 Revenue

The following factors were used in the Turmalina complex cashflow:

- 1,700 tonnes per day mining from underground (600,000 tonnes per year).
- Mill recovery for the Turmalina orebodies is 87%, the mill recovery for Faina is 55%
- Gold at refinery 99.95% payable.
- Exchange rate US$1.00 = BRL5.20.
- Metal price: US$1,650 per ounce gold.
- Net Smelter Return includes doré refining, transport, and insurance costs.
- Revenue is recognized at the time of production.

The Faina orebody has a lower recovery due to gold being contained in sulphides. Currently, Jaguar is milling Faina ore within the existing mill with little modifications to the mill. This will result in a recovery of 55%.

22.1.2 Costs

- Mine life: 6 years.
- Life of Mine production plan as summarized in Table 16.3.
- Mine life capital totals $47.2 million, including 15% contingency on non-sustaining capital.
- Average operating cost over the mine life is $78.77 per tonne milled.

22.1.3 Taxation and Royalties

Jaguar pays out both surface and mineral rights to various people and organizations. Table 22-1 lists the royalties.

Table 22-1: Royalties

Holder	Royalty	Orebody	Payment Status in R$[1]	
			Status	Paid in 2023 US$
Eduardo C. de Fonseca	5% of the Production Gross Profits until reaching US$10 million during current fiscal year, then 3% of the Production Gross Profit	A, B and C	Inactive	-
Carlos Andraus / Mirra Empreend. E Participações Ltda.			Active (30%)	2,372,479.86
Vera A. Di Pace / Vermar Empreend. E Participações Ltda.			Active (30%)	2,372,479.86
Paulo C. De Fonseca / Sandalo Empreend. E Participações Ltda.			Active (16%)	1,265,322.59
Clara Darghan/Mocla Empreend. E Participações Ltda.			Active (12%)	948,991.95
Eduardo Camiz de F. Junior / Agro Pecuária Aldebaram Empreend. Ltda.			Active (12%)	948,991.95
Surface Rights Royalties				
Holder	**Refers to**	**Orebody**	**Payment Status in R$[1]**	
			Base Value (a month)	**Paid in 2023**
José Laeste de Lacerda	Surface	A, B and C	14,812.00	14,812.00
Wilson Clemente de Faria	Building rent		13,570.00	139,443.65
	Surface		2,788.00	
EPAMIG	Surface	Faina	35,000.00	444,751.00
Moreiras Empreendimentos	Surface	Faina	-	30,011.36
Familia Freitas	Water pipe	A, B and C	13,200.00	161,644.75
	Water well		1,980.00	
	Road access		2,904.00	

The taxes paid are equivalent to US$5.68/t.

22.2 Cash Flow Analysis

The undiscounted after-tax cash flow for the Project totals $101.9 million over the mine life. The after-tax Net Present Value (NPV) at a 7.5% discount rate is $77.6 million, as shown in Table 22-2.

Table 22-2: After-Tax Cash Flow Summary

Description	Value
Realized Market Prices	
Au ($/oz)	1,650
Payable Metal	
Au (koz)	240
	US$ million
Total Gross Revenue	**395.5**
Mining Cost	104
Process Cost (Turmalina)	49.6
Process Cost (Faina)	29.2
G&A Cost	17.5
Total Operating Costs	**200.8**
Operating Margin (EBITDA)	**194.8**
Cash Taxes Payable	13.9
Operating Cash Flow	
Development Capital	35.3
Sustaining Capital	5.2
Total Closure/Reclamation Capital	6.7
Total Capital	**47.3**
Pre-tax Free Cash Flow	**115.8**
Pre-tax NPV @ 7.5%	**88.1**
After-tax Free Cash Flow	**101.9**
After-tax NPV @ 7.5%	**77.6**

The World Gold Council Adjusted Operating Cost (AOC) is US$837.07 per ounce of gold. The mine life capital cost, including both pre-production and sustaining unit cost, is US$197.12 per ounce, for an All in Sustaining Cost (AISC) of US$1,034.20 per ounce of gold. Once the Project enters commercial production, the AISC is US$1,034.20 per ounce of gold. Average annual gold production during operation is 40,000 ounces per year.

The after-tax Net Present Value (NPV) at a 10% discount rate is $80.98 million.

A detailed cash flow is presented in Appendix 1.

22.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

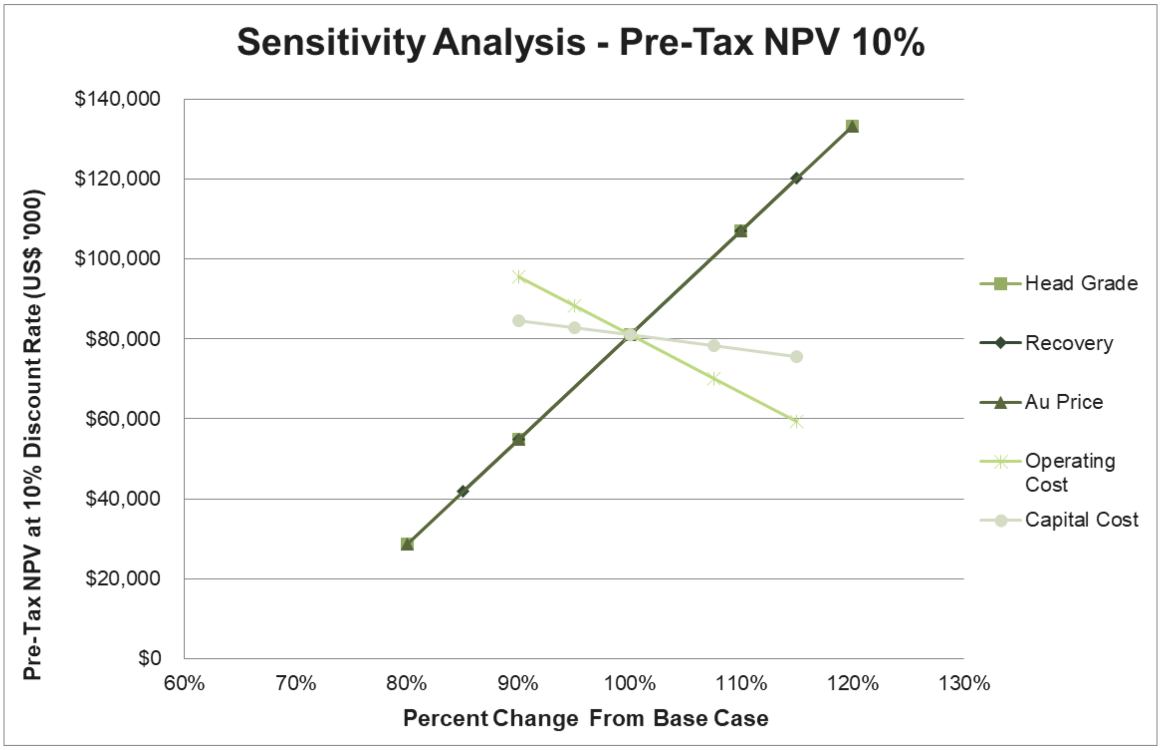
- Gold price $1,650 US$/oz
- Exchange rate 5.2 BRL to 1 US$
- Head grade 4.08 g/t
- Operating costs $78.77/t
- Mine life is 6 years.

Pre-tax IRR sensitivity over the base case has been calculated for -20% to +20% variations. The sensitivities are shown in Figure 22-1 and Table 22-3.

Table 22-3: After-Tax Sensitivity Analyses

Variance	Head Grade (g/t Au)	NPV at 10% (US$000)
80%	3.26	$28,741
90%	3.67	$54,859
100%	**4.08**	**$80,978**
110%	4.49	$107,096
120%	4.89	$133,214
Variance	**Recovery (% Au)**	**NPV at 10% (US$000)**
85%	74%	$41,800
90%	78%	$54,859
100%	**87%**	**$80,978**
110%	96%	$107,096
115%	100%	$120,155
Variance	**Metal Prices (US$/oz Au)**	**NPV at 10% (US$000)**
80%	$1,320	$28,741
90%	$1,485	$54,859
100%	**$1,650**	**$80,978**
110%	$1,815	$107,096
120%	$1,980	$133,214
Variance	**Operating Cost (US$ 000)**	**NPV at 10% (US$000)**
90%	$180,677	$95,441
96%	$190,714	$88,209
100%	**$200,752**	**$80,978**
107.5%	$215,808	$70,130
115%	$230,865	$59,282
Variance	**Capital Costs (US$ 000)**	**NPV at 10% (US$000)**
90%	$42,548	$84,534
96%	$44,912	$82,756
100%	**$47,276**	**$80,978**
107.5%	$50,821	$78,310
115%	$54,367	$75,642

Figure 22-1: After-Tax Sensitivity Analysis



23.0 Adjacent Properties

There are no adjacent properties relevant to the Turmalina Complex.

24.0 Other Relevant Data and Information

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

25.0 Interpretation and Conclusions

25.1 Geology and Mineral Resources

- The land holdings comprising the MTL Complex were increased in 2023 with the acquisition of the Pitangui claim block. This claim block contains the São Sebastiao deposit.
- The Mineral Resources for the MTL Complex comprise five distinct deposits, namely the Turmalina Mine, Faina, Pontal and Pontal South (collectively, the Pontal Deposits), Zona Basal, and São Sebastiao deposits.
- Mining operations are currently focused mainly on extraction of mineralized material from Orebody C of the Turmalina Mine, with secondary production being achieved from Orebodies A and B. Underground access is currently being established to the Faina deposit.
- The current Mineral Resource estimate includes an initial estimate of the Pontal South deposit Resources, which is a mineralized zone discovered in 2023 along the southeastern strike projection of the previously known mineralization of the Pontal deposit. This is the first-time disclosure of technical supporting information for the collective Pontal deposits.
- The current Mineral Resource estimate includes the initial disclosure of technical supporting information for the Zona Basal deposit Resources.
- The current Mineral Resource estimate also includes Jaguar's first-time disclosure of the Mineral Resources estimated for the São Sebastião deposit.
- The total combined Mineral Resources for the five deposits comprising the MTL Complex are estimated to total approximately 8.50 million tonnes (Mt) at an average grade of 4.23 g/t Au in the Measured and Indicated Mineral Resource categories (approximately 1.16 million ounces (Moz) Au). An additional amount of approximately 7.64 Mt at an average grade of 3.58 g/t Au (approximately 0.88 Moz Au) is estimated in the Inferred Mineral Resource category.

25.2 Mining and Mineral Reserves

- The MTL Complex Mineral Reserve estimates were prepared in accordance with CIM (2014) definitions.
- Proven and Probable Mineral Reserves total 2.47 Mt at an average grade of 4.08 g/t Au, containing 324,000 oz Au. The Mineral Reserve estimate includes an initial estimate of 0.79 Mt at a grade of 5.22 g/t Au, containing 132,000 oz Au, at Faina.
- The Turmalina deposit is suitable for SLOS, considering the orebody's configuration and geotechnical characteristics.
- Orebody C has replaced Orebody A as the Turmalina Mine's principal production source. Orebody A has paused mining at depth until market conditions are more favourable.
- The Turmalina Mine's ventilation system is pull type with fresh air drawn down the ramp and an intake raise, and return air exhausted via three ventilation raises.

- The Turmalina Mine operations area has a workforce of approximately 700 personnel, with Jaguar personnel accounting for approximately 62% of the workforce and the remainder being contractor employees.

25.3 Mineral Processing and Metallurgical Testing

25.3.1 Turmalina

- During 2021, the Turmalina Plant processed approximately 409,700 t at an average grade of 3.12 g/t Au and the overall plant recovery was 88.6%. The current mine plan includes ore from the Turmalina mine and the Faina deposit. The peak production rate in the LOM plan is 2025 and 2026 producing approximately 600,000 tonnes per year (tpa) or 1,644 tonnes per day (tpd). The Turmalina Plant has a nominal processing capacity of 2,000 tpd ore (720,000 tpa) providing approximately 18% excess capacity at the planned peak production rate.
- The Turmalina leaching circuit consists of seven agitated tanks operating in series. Lime and NaCN are added to the first tank to adjust the pH and commence the leaching process. If required for processing Faina and Pitangui ores, the first tank(s) can be used for sulphide preoxidation, adding oxygen or air and lime. NaCN would then be added in the second tank to begin the leaching process.
- The Turmalina Plant achieves consistent recoveries between 87% and 92% processing Turmalina ore.

Faina

- TESTWORK Desenvolvimento de Processo Ltda. (TDP) conducted a series of diagnostic tests on two composite samples to determine the amenability of gold extraction from Faina material using different processes. The highest gold recovery achieved was from a combination of gravity concentration followed by flotation of gravity tails on sample SF1 (92.36% overall gold recovery).
- The current intent for processing Faina ore at Turmalina is direct carbon in leach (CIL) with leach additives, which is expected to yield overall recoveries of approximately 55%.
- The results of the SF1 tests indicate that Au recovery is higher for the direct leach tests than the CIL tests and that the Au recovery is proportional to particle size distribution. The highest gold recovery in direct leaching (53.51%) was obtained at a particle size of 80% passing (P_{80}) = 53 µm (test LT6). The highest gold recovery in CIL tests (48.97%) was obtained at a particle size of P_{80} = 53 µm (test LT11).
- Direct carbon in leach (CIL) testing was performed on two composite samples without gravity concentration. The tests conditions included a 6 hr preleach with lime and a 48 hr CIL leach retention time. The leach recoveries for LT1 and LT2 averaged 48.0% and the leach recoveries for LT5 and LT6 averaged 49.27%
- Direct CIL tests were performed on composite samples and in one case flotation tailings using the standard 6 hour preleach followed by 48 hours of CIL and with a variety of leach additives including O2, air, Pb(NO3)2, H2O2 and the polymer ZT POLY MINE.
  - The highest 18-hour leach recovery was 66.06% using air and 400 g/t ZT Polymine though the recovery dropped to 44.4% after 24 hours of leaching indicating reprecipitation.

- In all cases, using hydrogen peroxide and ZT Polymine had higher recoveries after 18 hours than after 24 hours indicating reprecipitation of dissolved gold over time, possibly due to low NaCN solution concentrations from oxidation of NaCN by hydrogen peroxide and ZT Polymine.
- CIL leaching with oxygen rather than air and no additives resulted in a Au recovery of 43.06% and the same conditions but Pb(NO3)2 increased the Au recovery to 46.7%.
- Additional testing should be performed to determine the reason for reprecipitation.

25.3.2 Pitangui

- Metallurgical testing programs on Pitangui samples were completed by SGS Minerals Services (SGS), Lakefield, Ontario in 2014 and ALS Metallurgy (ALS), Kamloops, British Columbia in 2016.
- Mineralogy studies reported that the main sulphide minerals in the ore were pyrrhotite (12 to 31%) with variable levels of arsenopyrite (0.6 to 3.0%) and a limited amount of pyrite (up to 1.5%). Pyrrhotite is a highly reactive sulphide mineral and a major NaCN and oxygen consumer contributing to high cyanide and lime consumption.
- SGS conducted 48 hour whole ore leach (WOL) testing on both composites. Pre-aeration was done using air or pure oxygen from 2 to 18 hours before leaching. Calculated gold extractions ranged from 89% to 96% for the two samples. Lime consumption was relatively constant at 1.0 kg/t to 1.6 kg/t.
- The study assumes that the plant will operate a WOL circuit with adequate pre-aeration to sustain dissolved oxygen levels and will provide at least a 24-hour leach residence time. Primary grind size should be 80% passing 53 µm or finer with the provision to add lead nitrate as required.

25.4 Infrastructure

- The MTL Complex infrastructure is sufficient for the 2,000 tpd mining and milling operations at Turmalina, Faina, and Pontal operations. There is no infrastructure related to the Faina and Pontal historic open pit operations.
- Electrical power is obtained from the national grid.
- Water and sewer access for the Turmalina Mine and Turmalina Plant are via the local system.
- All tailings are either dry stacked on surface or used as cemented paste fill underground. A tailings storage facility, which includes a dam, was in use until September 2021, and is now in the process of closure.

25.5 Environment

- Jaguar has an Environmental and Social Governance Framework and several supporting policies. The company is also committed to complying with international best practice.
- Jaguar acquired the Pitangui property in September 2023, therefore no environmental studies, social engagement or permit planning has been conducted at this stage.
- No environmental issues were identified from the documentation available for the SLR QP's review of the existing operations. The Complex complies with applicable Brazilian

permitting requirements. The approved permits and the license renewals address the Brazilian authority's requirements for mining extraction and operation activities.

- Environmental monitoring is carried out by Jaguar at the Turmalina Complex according to the obligations defined in the environmental permits. These include surface water quality, groundwater quality, air quality, and ambient noise.
- Jaguar maintains relationships with nearby communities and stakeholders. Jaguar's commitment to community development and programs is demonstrated through its ongoing investments in the "Seeds of Sustainability" program and other social investment projects.
- Information on any existing or potential heritage or archeological resources was not provided at the time of this review, and the mine does not have a Chance Find procedure.

26.0 Recommendations

26.1 Geology and Mineral Resources

26.1.1 Exploration

1 Continue planned exploration, targeting shallow extensions to mineralization along the Orebody B trend as well as drilling the down-plunge and along-strike projections of Orebody C.

2 Consider initiating an exploration program that targets the presence of additional parallel structures located in proximity to Orebodies A, B, and C using a small number of horizontal drill holes drilled into the hangingwall and footwall of the known orebodies.

3 Evaluate the strike and depth potential of Orebody D.

4 Evaluate the depth potential of Zona Basal.

5 Target extensions along strike and down dip from higher grade mineralized intercepts at Pontal. Additionally, the drilling efforts should aim to confirm the orientations of mineralization northeast of the primary lithological contacts.

6 Conduct a regional exploration program on the Turmalina land holdings to search for additional mineralized zones.

7 Evaluate the exploration potential of the newly acquired Pitangui claim block.

26.1.2 Quality Assurance/Quality Control

1 Modify the QA/QC program to include duplicate assaying using sample pulps.

26.1.3 Mineral Resource Estimates

1 Include a field for the sample identification number for all assay data exports from the primary database to the individual software packages being used to complete the Mineral Resource estimates.

2 Correct erroneous or anomalous information for drill holes that are located in the un-mined portions of the Turmalina deposit.

3 Remove drill hole or channel samples considered to be of unreliable quality from the active database, and place these into a database that is dedicated specifically for records considered to be of unreliable quality.

4 Modify the wireframe construction strategy to use a cut-off grade that more closely reflects the Mineral Resource cut-off grade for each orebody. It is anticipated that this will increase the average grades of the mineralized wireframes by reducing the amount of internal dilution that is currently being included.

5 Analyze possible revised capping values for Orebody C in the 30 g/t Au to 45 g/t Au range to determine whether application of a revised capping value will improve grade reconciliation with production data.

6 Prepare and code a lithological model for the Turmalina Mine into the block model to be used to improve the allocation of the density measurements for future Mineral Resource

updates. Collect additional density measurements from samples contained within the mineralized wireframes of Orebody B.

7 Continue geological mapping, along with structural and alteration studies, to understand the nature of the gold mineralization and the structural and stratigraphic controls on the distribution of the gold values for Orebody C. The results of these studies will be of great use in understanding the controls on the distribution of the higher grade pods and will aid in developing exploration targets in this area of the mine property.

8 Consider the use of a dynamic anisotropy method for estimation of gold grades into the Turmalina mine block model.

9 Review the anisotropy ratios on an individual wireframe basis for the Turmalina mine rather than on an orebody basis.

10 Carry out a short study to determine the optimum selection of search strategy input parameters to reduce the number of estimation artifacts for the mineralized lenses in the Turmalina mine.

11 Collect additional drill hole information in the areas containing estimation artifacts to improve the confidence level of the Mineral Resource estimate, reduce and remove the estimation artifacts, and search for the down-dip projections of the mineralization.

12 When no CMS model is available for a given excavation volume, use the design shape for the excavations in question as a proxy when preparing the reconciliation reports.

13 Adjust the Deswik parameters to better align to the local strike and dip variations of the resource wireframe reporting panels. This would allow the inclusion of additional material to the Mineral Resource.

14 Consider rehabilitation and dewatering of Pontal underground workings to improve the integration of underground sampling at Pontal with existing wireframe interpretation.

15 Review the Faina capping values periodically to reflect knowledge gained from production experience.

16 Revise the Pitangui mineralization wireframes to eliminate the use of 'pinch outs' and reduce the number of isolated wireframes with a single mineralized intercept. Additional efforts should be made to integrate the reference surfaces that control the lithological model wireframes with the mineralization wireframes to avoid clipping artifacts.

26.2 Mining and Mineral Reserves

1 Consider modelling mining costs by orebody, such that variable and incremental cut-off grades can be determined by orebody and the Mineral Reserve estimate, LOM plan, and processing capacity can be optimized.

2 Undertake a detailed incremental cost analysis, by orebody, to ensure that uneconomic material is not sent to the Turmalina Plant. Currently, the cost data available from the Turmalina Mine is not easily categorized. Unit mining costs vary between Orebody A, Orebody C, and Faina, given significant differences between mining width, production rates, ground conditions, and haul distances. The Turmalina Plant has excess production capacity, not otherwise put to use.

3 Continue to map and do geotechnical testing and logging in the Faina orebody.

4 Undertake a detailed ventilation assessment of the mine. Orebody A is being mined out and the ventilation demand is shifting.

5 Undertake a detailed power and water/pumping study of the mine to determine if saving can be done now that Orebody A is being mined out. Substations can be redistributed in the mine and pumps relocated.

26.3 Mineral Processing and Metallurgical Testing

1 Perform whole ore leach and/or CIL leach tests followed by flotation of leach tailings on Faina variability samples to optimize the process for all of the Faina deposit material types.

2 Identify potential smelters and pressure oxidation facilities that would be willing to purchase the Faina flotation concentrates.

3 Perform additional WOL leach tests on Faina material using air and ZT Polymine to determine the reason for the decrease in Au recovery after 18 hours of leaching. Reprecipitation due to NaCN consumption/depletion or other reasons.

4 Perform variability tests on the various Pitangui material types to optimize the preoxidation and cyanide leaching process. The objective is to maintain oxygen and NaCN solution concentrations for gold leaching in the presence of high pyrhotite concentrations.

5 Perform variability ore hardness testing on samples of both Faina and Pitangui materials as they require fine grinding (P_{80} 53µm) for optimal gold recovery.

26.4 Infrastructure

1 Evaluate opportunities to optimize the water pumping, power, and ventilation systems at the Turmalina Mine.

26.5 Environment

1 Jaguar acquired the Pitangui property in September 2023, therefore the required environmental studies will need to be conducted, a plan developed for conducting an environmental and social impact assessment, social engagement, for obtaining the required environmental authorizations and permits and surface rights well in advance of planned operations.

2 Continue to review management and mitigation corrective actions, as applicable, based on the data collected from the environmental monitoring programs.

3 Continue to monitor the long-term displacement and phreatic levels within filtered tailings stacks to observe trends and confirm physical stability, and continue to address recommendations made in the external tailings dam inspection and safety audit reports.

4 Continue to monitor seepage from all tailings disposal areas to confirm chemical stability.

5 Continue social engagement activities and the social projects in accordance with community feedback.

6 Develop and implement heritage and archaeological resources Chance Finds Procedure in accordance with international best practice.

26.6 Capital and Operating Costs

1 Consider modelling mining costs by orebody, such that variable and incremental cut-off grades can be determined by orebody and the Mineral Reserve estimate, LOM plan, and processing capacity can be optimized.

2 Undertake a detailed incremental cost analysis, by orebody, to ensure that uneconomic material is not sent to the Turmalina Plant. Currently, the cost data available from the Turmalina Mine is not easily categorized. Unit mining costs vary between Orebody A, Orebody C, and Faina, given significant differences between mining width, production rates, ground conditions, and haul distances. The Turmalina Plant has excess production capacity, not otherwise put to use.

27.0 References

Alvim, M. D. 2014, Jaguar Mining Geological Database Validation: Unpublished internal document prepared for Jaguar Mining, 93 p.

Almeida, A.M., Bueno do Prado, M.G., Corréa Neto, A.V., Mabub, R.O., de Araújo, Manduca, L.G., Montenegro, P.H. da S., Sampiao, M.F., Schlichta, T.M., 2016. São Sebastião Gold Deposit, Onça do Pitangui, Minas Gerais, Brazil: A Greenfields Discovery, SIMEXMIN 2016, ADIMB Minas Gerais.

Alves, Felipe Emerson André. 2020. "Geoquímica, mineralogia, estratigrafia e estilo de mineralização aurífera dos depósitos Turmalina, Pilar e Santa Isabel (Sul do Cráton do São Francisco, Brasil) [Unpublished PhD thesis], Federal University of Rio de Janeiro (UFRJ).

Barros, I. 2021a. Lixiviação de Minério do Corpo CNW, Laboratório de Processos, Jaguar Mining Inc., internal report, Maio, 2021, pp. 19.

Barros, I. 2021b. Cianetação de Amostras de Lavra, Laboratório de Processos, Jaguar Mining Inc., internal report, Novembro, 2021, pp. 16.

Barros, I. 2021., Estudo de Gravimetria e Cianetação Para o Circuito de Planta Metalúrgica de MTL, Laboratório de Processos, Jaguar Mining Inc., internal report, Dezembro, 2021, pp. 17.

Barros, I. 2022. Cianetação de Amostras de Lavra – Corpo A e C, Laboratório de Processos, Jaguar Mining Inc., internal report, Janeiro, 2022, pp. 12.

Brando Soares, M., Corrêa Neto, A.V., Zeh, A., Cabral, A.R., Pereira, L.F., Prado, M.G.B, Almeida, A.M, Manduca, L.G., Silva, P.H.M, Araújo, I.M.C.P. 2018. Multistage Mineralization at the Pitangui Greenstone Belt, Minas Gerais, Brazil: Stratigraphy, Geochronology and BIF Geochemistry. Precambrian Research. 291, 17-41.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM). 2014. CIM Definition Standards for Mineral Resources and Mineral Reserves, adopted by CIM Council on May 10, 2014.

Corredor H., Jaime A. 2018. Geotechnical Properties of Turmalina Mine, Internal Report Jaguar Mining Inc., pp. 1-17.

Dam Projectos de Engenharia, 2022: Semester 1 Turmalina Dam Regular Safety Inspection Report and Dam Safety Audit.

Dam Projectos de Engenharia, 2023: Semester 1 Turmalina Dam Regular Safety Inspection Report and Dam Safety Audit.

de Souza, Márcia Cristina. 2006. Cyanidation Tests in Samples from the Turmalina Mine, Internal Report for MSOL, May 6, 2006.

GeoHydroTech Engenharia, 2022: Regular Safety Inspection Report – Tourmaline Dam

Hill, J.V. and Tomaselli, B.Y. 2020. Technical Report on the Turmalina Mine Complex, Mina Gerais State, Brazil, prepared for Jaguar Mining Inc., NI 43-101 Report, Deswik Brazil and Jaguar Mining Inc., April 17, 2020.

Jaguar Mining Inc. 2014a. Jaguar Mining Intercepts 15.32 Grams Per Tonne Over 19.0 Meters at the Turmalina Mine: News release dated October 9, 2014, Obtained from the SEDAR website at www.SEDAR.com, 4 p.

Jaguar Mining Inc. 2014b. Company presentation dated March 2, 2014.

Jaguar Mining Inc. 2015. Jaguar Reports Q4 2014 Gold Production and Provides 2015 Guidance: News release dated January 8, 2015, Obtained from the SEDAR website at www.SEDAR.com, 5 p.

Jaguar Mining Inc. 2016. Jaguar Reports Q4 2015 Gold Production, Releases Annual 2016 Guidance: News release dated January 19, 2016, Obtained from the SEDAR website at www.SEDAR.com, 4 p.

Jaguar Mining Inc. 2017. Jaguar Exceeds 2016 Gold Production Guidance: News release dated January 18, 2017, Obtained from the SEDAR website at www.SEDAR.com, 4 p.

Jaguar Mining Inc. 2018. Jaguar Mining Continues to Intercept Significant Gold Mineralization at Orebody C; Pilar and Turmalina Principal Orebodies Report Increasing Grades and Thickness: News release dated June 18, 2018, Obtained from the SEDAR website at www.SEDAR.com, 15 p.

Jaguar Mining Inc. 2020. Sustainability Report 2020.

Jaguar Mining Inc. 2023. Annual Information Form for the Year Ended December 31, 2022. Obtained from the SEDAR website at www.SEDAR.com, 98 p.

Jaguar Mining Inc. 2023b. Jaguar Mining Completes Strategic Acquisition of the Brazilian Assets of IAMGOLD. News release issued on September 13, 2023 available from the Jaguar Mining website at https://jaguarmining.com/en/investors/news-releases/2023/jaguar-mining-completes-strategic-acquisition-of-the-brazilian-assets-of-iamgold/ .

Jaguar Mining Inc. 2023c. Jaguar Mining Announces Agreement to Acquire the Pitangui Project and Remaining Interest in the Acurui Project from IAMGOLD. News release issued on August 2, 2023 available from the Jaguar Mining website at https://jaguarmining.com/en/investors/news-releases/2023/jaguar-mining-announces-agreement-to-acquire-the-pitangui-project-and-remaining-interest-in-the-acurui-project-from-iamgold/ .

Jaguar Mining Inc. 2023d. Turmalina Delivers Further High-Grade Intercepts from In-Mine, Exploration and Resource Conversion Drilling, New release issued on February 14, 2023 available from the Jaguar website at https://jaguarmining.com/en/investors/news-releases/2023/turmalina-delivers-further-high-grade-intercepts-from-in-mine-exploration-and-resource-conversion-drilling/ .

Ladeira, E.A. 1980. Metalogenesis of Gold at the Morro Velho Mine and in Nova Lima District, Quadrilátero Ferrífero, Minas Gerais, Brazil. University of Western Ontario, Unpublished Ph.D. Thesis, London, Ontario, Canada: 272 p.

Ladeira, E.A. 1991. Genesis of gold in Quadrilátero Ferrífero: A remarkable case of permanency, recycling and inheritance - A tribute to Djalma Guimarães, Pierre Routhier and Hans Ramberg. In Ladeira, E.A., ed., Proceedings of Brazil Gold '91. An International Symposium on the Geology of Gold: Belo Horizonte, 1991: A.A. Balkema, Rotterdam, pp. 11-30.

Machado, I.C. 2005. Turmalina Gold Project, Feasibility Draft 12C, Including Cash Flow: Unpublished Internal Report Prepared for Jaguar Mining Inc.

Machado, I.C. 2007., Paciencia Gold Project, Santa Isabel Mine. Volume I. Feasibility Study. TechnoMine Services, LLC, August 7, 2007.

Machado, I.C. 2007b. Turmalina Gold Project, Satinoco Target Resource Statement. TechnoMine Services, LLC, October 22, 2007.

Machado, I.C. 2008a. Turmalina Gold Project: Satinoco Target Resource Statement. TechnoMine Services LLC, February 5, 2008.

Machado, I.C. 2008b. Caeté Expansion (CTX) Gold Project Pilar and Roça Grande Properties. Feasibility Study, Volume I. TechnoMine Services, LLC, September 15, 2008.

Machado, I.C. 2008c. Turmalina Expansion Project (Phase I – 610 ktpy), Turmalina “Satinoco” and “Main” Ore Bodies, Feasibility Study: Unpublished Technical Report, 150 p.

Machado, I.C. 2011. Turmalina Gold Mining Complex Faina, Pontal, and Body D Targets Statement of Resources. Volume I. TechnoMine Services LLC, October 19, 2011.

Marinho, M.S., Silva, M.A., Lombello, J.C., Di Salvio, L.P. Silva, R.N., Féboli, W.L., and Brito, D.C. 2018. Projecto ARIM-Áreas de elevante Interesse Mineral – Noroeste do Quadrilátero Ferrifero – Mapa Geológico Integrado do Sinclinório Pitangui, Belo Horizonte, CPRM, 2018, 1 map, scale 1:75 000.

Martini, S. L. 1998. An Overview of Main Auriferous Regions of Brazil, in Revista Brasileiera de Geociências, Volume 28, 1998.

Parker, H. 2014. Reconciliation Principles for the Mining Industry: in Mineral Resource and Ore Reserve Estimation, The AUSIMM Guide to Good Practice, The Australasian Institute of Mining and Metallurgy Monograph 30, Second Edition, pp. 721-738.

RPA. 2005. Technical Report on the Turmalina Gold Project, Pitangui, Minas Gerais, Brazil – NI43-101 Report Prepared by Clow, G. G., and Valliant, W. W., for Jaguar Mining Inc. by Roscoe Postle Associates Inc., September 16, 2005.

RPA. 2006. Technical Report on the Turmalina Gold Project, Pitangui, Minas Gerais, Brazil – NI43-101 Report Prepared by Clow, G. G., and Valliant, W. W., for Jaguar Mining Inc. by Roscoe Postle Associates Inc., July 31, 2006, 120 p.

RPA. 2015. Technical Report on the Turmalina Mine, Minas Gerais State, Brazil: Report Prepared by Cox, J., and Pressacco, R., for Jaguar Mining Inc. available on the SEDAR website at www.SEDAR.com, 175 p.

RPA. 2016. Technical Report on the Turmalina Mine, Minas Gerais State, Brazil: Report Prepared by Cox, J., and Pressacco, R., for Jaguar Mining Inc. available on the SEDAR website at www.SEDAR.com, 169 p.

RPA. 2017. Technical Report on the Turmalina Mine, Minas Gerais State, Brazil: Report Prepared by Cox, J., and Pressacco, R., for Jaguar Mining Inc. available on the SEDAR website at www.SEDAR.com, 175 p.

RPA. 2019. Technical Report on the Turmalina Mine, Minas Gerais State, Brazil: Report Prepared by Sepp J, and Pressacco, R., Patel, A for Jaguar Mining Inc. available on the SEDAR website at www.SEDAR.com, 177 p.

Scarpelli, W. 1991. Aspects of gold mineralization in the Iron Quadrangle, Brazil. In Ladeira, E.A., ed., Proceedings of Brazil Gold '91, An International Symposium on the Geology of Gold: Belo Horizonte, 1991: A.A. Balkema, Rotterdam, pp. 151-158.

SGS Geosol Laboratórios Ltda. 2016. Relatorio de QA-QC: Unpublished Internal Document Prepared for Jaguar Mining, 28 p.

SLR, 2021. High Level Review of the Faina Project, Draft Report, prepared for Jaguar Mining Inc. (August 13, 2021).

SLR. 2022. Technical Report on the Turmalina Mine, Minas Gerais State, Brazil: Report Prepared by Sepp, J., Pressacco, R., El-Rassi, D., Lopes, R.G., Blaho, S.R., and Scholey, B.J.Y for Jaguar Mining Inc. available on the SEDAR website at www.SEDAR.com, 253 p.

SRK 2014. Independent Technical Report for the São Sebastião Gold Deposit, Pitangui Project, Brazil. Prepared for IAMGOLD Brasil Ltda (IAMGOLD Corporation) available on the SEDAR+ website at https://www.sedarplus.ca/landingpage/, 85 p.

SRK Consulting (Canada) Inc. (SRK) 2020. Independent Technical Report for the São Sebastião Gold Deposit, Pitangui Gold Project, Brazil. Report prepared by Mitrofanov, A., and Cole, G., for IAMGOLD Corporation available on the SEDAR+ website at https://www.sedarplus.ca/landingpage/ , 113 p.

SRK 2021. Preliminary Economic Assessment for the Pitangui Gold Project. Prepared for IAMGOLD Corporation available on the SEDAR+ website at https://www.sedarplus.ca/landingpage/, 216 p.

TESTWORK Desenvolvimento de Processo Ltda. 2020. Relatório final, Estudos de Geometalurgica com Amostras dos Corpos de Minério da Mina Turmalina, Jaguar Mining Inc., Julho 2020.

TESTWORK Desenvolvimento de Processo Ltda. 2021a. Relatorio Preliminar, Testes de Laboratório para Determinação de Rota de Tratamento do Minério de Ouro da Mina Faina, Jaguar Mining Inc., Junho 2021.

TESTWORK Desenvolvimento de Processo Ltda. 2021b. Testes Metalúrgicos Jaguar Mining Projeto: Faina, Presentação Dos Resultados Preliminares, Junho 2021.

Thorman, C.H., and Ladeira, E.A. 1991. Introduction to a workshop on gold deposits related to greenstone belts in Brazil--Belo Horizonte, Brazil, 1986 in Thorman, C.H. Ladeira, E.A., and Schnabel, D.C., eds., Gold deposits related to greenstone belts in Brazil —Deposit modeling workshop, Part A--Excursions: U.S. Geological Survey Bulletin 1980-A, pp. A5-A22.

Thorman, C.H., DeWitt, E., Maron, W.A.C., and Ladeira, E.A. 2001. Major Brazilian Gold deposits –1982 to 1999. Mineralium Deposita, pp. 218-227.

Vieira, F.W.R. 1991. Textures and processes of hydrothermal alteration and mineralization in the Nova Lima Group, Minas Gerais, Brazil. In Ladeira, E.A., ed., Proceedings of Brazil Gold '91, An International Symposium on the Geology of Gold: Belo Horizonte, 1991: A.A. Balkema, Rotterdam, pp. 319-326.

WALM Engenharia, 2023: Regular Safety Inspection Report – Tourmaline Dam

Zucchetti, M., et al. 2000. Volcanic and Volcaniclastic Features in Archean Rocks and Their Tectonic Environments, Rio Das Velhas Greenstone Belt, Quadrilátero Ferrífero, MG, Brazil, in Revista Brasileiera de Geociencias, Volume 30, 2000.

28.0 Date and Signature Date

This report titled "Technical Report on the Turmalina Mining Complex, Minas Gerais, Brazil" with an effective date of November 30, 2023 was prepared and signed by the following authors:

(Signed & Sealed) ***Jeff Sepp***

Dated at Toronto, ON
February 2, 2024

Jeff Sepp, P. Eng.

(Signed & Sealed) ***Pierre Landry, P.Geo.***

Dated at Victoria, BC
February 2, 2024

Pierre Landry, P.Geo.

(Signed & Sealed) ***Reno Pressacco***

Dated at Toronto, ON
February 2, 2024

Reno Pressacco, M.Sc.(A)., P.Geo.

(Signed & Sealed) ***A. Paul Hampton***

Dated at Lakewood, CO
February 2, 2024

A. Paul Hampton, P.Eng.

(Signed & Sealed) ***Jason J. Cox***

Dated at Toronto, ON
February 2, 2024

Jason J. Cox, P.Eng.

29.0 Certificate of Qualified Person

29.1 Jeff Sepp

I, Jeff Sepp, P.Eng., as an author of this report entitled "Technical Report on the Turmalina Mine Complex, Minas Gerais, Brazil", with an effective date of November 30, 2023, prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Consultant Mining Engineer with SLR Consulting (Canada) Ltd, of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of Laurentian University, Sudbury, Ontario in 1997 with a B.Eng. degree in Mining.
3. I am registered as a Professional Engineer in the Province of Ontario (Reg.# 100139899). I have worked as a mining engineer for a total of 24 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Mine planning, open pit and underground mine design and scheduling, ventilation design and implementation for numerous projects in Canada, USA, Turkey, Saudi Arabia, United Kingdom, Mali, Tanzania, Ghana, and Sweden.
   - Senior mining consultant at MineRP Canada Limited.
   - Mining engineer/ventilation specialist for a number of Canadian mining companies, including CVRD Inco (now Vale) and Cameco Corp.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I most recently visited the MTL Complex on December 8, 2022. I have previously visited the Turmalina Mine on December 11, 2018.
6. I am responsible for Sections 1.1, 1.1.1.2, 1.1.2.2, 1.2, 1.3.5, 1.3.6, 1.3.11, 2, 3, 15,16, 21, 22, 24, 25.2, 26.2, 26.6, and 30 and contributions to Section 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have previously been involved with the preparation of a technical report, dated March 31, 2022, on the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 1.1, 1.1.1.2, 1.1.2.2, 1.2, 1.3.5, 1.3.6, 1.3.11, 2, 3, 15,16, 21, 22, 24, 25.2, 26.2, 26.6, and 30 in the Technical Report, for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 2nd day of February, 2024,

(Signed & Sealed) ***Jeff Sepp***

Jeff Sepp, P.Eng.

29.2 Pierre Landry

I, Pierre Landry, P.Geo., as an author of this report entitled "Technical Report on the Turmalina Mine Complex, Minas Gerais, Brazil", with an effective date of November 30, 2023, prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Principal Geologist and Valuations Lead of SLR Consulting (Canada) Ltd. My office address is 3960 Quadra Street, Unit 303, Victoria, BC V8X 4A3.
2. I am a graduate of Queen's University, Kingston, Ontario, in 2006 with a B.Sc.H degree in Geological Science (Major) and Economics (Minor).
3. I am registered as a Professional Geologist in the Province of British Columbia (Licence #47339), and in the Province of Newfoundland and Labrador (Reg. #10431). I have been practising as a professional geologist 10 years. My relevant experience for the purpose of the Technical Report is:
    - Review and creation of block models as part of NI 43-101 Mineral Resource estimates, audits, and due diligence reports.
    - Mine Exploration Geologist at operations and mine development projects in Canada, Africa, and South America.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I have not visited the Turmalina Mining Complex
6. I am responsible for Sections 1.1.1.1, 1.1.2.1, 1.3.4, 12, 14, 23, 25.1, and 26.1 and contributions to Section 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have previously been involved with the preparation of a technical report dated March 31, 2022, on the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 1.1.1.1, 1.1.2.1, 1.3.4, 12, 14, 23, 25.1, and 26.1 in the Technical Report, for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 2nd day of February, 2024,

(Signed & Sealed) ***Pierre Landry***

Pierre Landry, P.Geo.

29.3 Reno Pressacco

I, Reno Pressacco, M.Sc.(A)., P.Geo., as an author of this report entitled "Technical Report on the Turmalina Mine Complex, Minas Gerais, Brazil", with an effective date of November 30, 2023, prepared for Jaguar Mining Inc., do hereby certify that:

1. I am an Associate Principal Geologist with SLR Consulting (Canada) Ltd, of Suite 501, 55 University Ave., Toronto, ON, M5J 2H7.
2. I am a graduate of Cambrian College of Applied Arts and Technology, Sudbury, Ontario, in 1982 with a CET Diploma in Geological Technology, Lake Superior State College, Sault Ste. Marie, Michigan, in 1984, with a B.Sc. degree in Geology and McGill University, Montreal, Québec, in 1986 with a M.Sc.(A) degree in Mineral Exploration.
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #939). I have worked as a geologist for a total of 37 years since my graduation. My relevant experience for the purpose of the Technical Report is:
    - Preparation, reviews and reporting as a consultant for Mineral Resource estimates on numerous exploration and mining projects around the world.
    - Numerous assignments in North, Central and South America, Europe, Russia, Armenia and China for a variety of deposit types and in a variety of geological environments; commodities including Au, Ag, Cu, Zn, Pb, Ni, Mo, U, PGM, REE, and industrial minerals.
    - Vice president positions with Canadian mining companies.
    - A senior position with an international consulting firm, and
    - Performing as an exploration, development, and production stage geologist for a number of Canadian mining companies.
    - Preparation of Mineral Resource estimates for open pit and underground mines for the three prior years.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I most recently visited Turmalina Mining Complex on December 8, 2022. I have previously visited the Turmalina Mine on November 20, 2014, and December 13, 2017.
6. I am responsible for Sections 1.3.1–1.3.3, and 4–11 and contributions to Section 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have previously prepared public domain Mineral Resource estimates and Technical Reports for the properties that are the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 1.3.1–1.3.3, and 4–11 of the Technical Report, for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 2nd day of February, 2024,

(Signed & Sealed) ***Reno Pressacco***

Reno Pressacco, M.Sc.(A)., P.Geo

29.4 A. Paul Hampton

I, A. Paul Hampton, P.Eng., as an author of this report entitled "Technical Report on the Turmalina Mine Complex, Minas Gerais, Brazil", with an effective date of November 30, 2023, prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Principal Metallurgist with SLR International Corporation, of Suite 100, 1658 Cole Boulevard, Lakewood, CO, USA 80401.
2. I am a graduate of Southern Illinois University in 1979 with a B.S. Degree in Geology, and a graduate of the University of Idaho in 1985, with an M.S. Degree in Metallurgical Engineering.
3. I am registered as a Professional Engineer in the Province of British Columbia, Licence No. 22046. I have worked as an extractive metallurgical engineer for a total of 35 years since my graduation. My relevant experience for the purpose of the Technical Report is:
    - Process plant engineering, operating and maintenance experience at mining and chemical operations, including the Sunshine Mine, Kellogg, Idaho, Beker Industries Corp, phosphate and DAP plants in Florida and Louisiana respectively, and the Delamar Mine in Jordan Valley Oregon.
    - Engineering and construction company experience on a wide range of related, precious metal projects and studies, requiring metallurgical testing, preliminary and detailed design, project management, and commissioning and start-up of process facilities and infrastructure. EPCM companies included Kilborn Engineering Pacific Ltd., SNC Lavalin Engineers and Constructors, Washington Group International Inc. and Outotec USA, Inc.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I have not visited the Turmalina Mining Complex.
6. I am responsible for Sections 1.1.1.3–1.1.1.4, 1.1.2.3–1.1.2.4, 1.3.7–1.3.7, 13, 17, 18, 25.3–25.4, and 26.3–26.4 and contributions to Section 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 1.1.1.3–1.1.1.4, 1.1.2.3–1.1.2.4, 1.3.7–1.3.7, 13, 17, 18, 25.3–25.4, and 26.3–26.4 in the Technical Report, for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 2nd day of February, 2024,

(Signed & Sealed) ***A. Paul Hampton***

A. Paul Hampton, P.Eng.

29.5 Jason J. Cox

I, Jason J. Cox, P.Eng., as an author of this report entitled "Technical Report on the Turmalina Mine Complex, Minas Gerais, Brazil", with an effective date of November 30, 2023, prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Global Technical Director – Canada Mining Advisory with SLR Consulting (Canada) Ltd, of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of the Queen's University, Kingston, Ontario, Canada, in 1996 with a Bachelor of Science degree in Mining Engineering.
3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #90487158). I have worked as a mining engineer for 25 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Review and reporting as a consultant on many mining operations and projects around the world for due diligence and regulatory requirements
   - Engineering study work (PEA, PFS, and FS) on many mining projects around the world, including commodities such as precious metals, base metals, bulk commodities, industrial minerals, and rare earths
   - Operational experience as Planning Engineer and Senior Mine Engineer at three North American mines
   - Contract Coordinator for underground construction at an American mine
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I have not visited the Turmalina Mining Complex.
6. I am responsible for Sections 1.1.1.5, 1.1.2.5, 1.3.9–1.3.10, 19, 20, 25.5, and 26.5 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 1.1.1.5, 1.1.2.5, 1.3.9–1.3.10, 19, 20, 25.5, and 26.5 in the Technical Report, for which I am responsible, contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 2nd day of February, 2024,

(Signed & Sealed) ***Jason J. Cox***

Jason J. Cox, P.Eng.

30.0 Appendix 1 Cash Flow Analysis

Table 30-1: Cash Flow Analysis

	INPUTS	UNITS	TOTAL	2023 Year 1	2024 Year 2	2025 Year 3	2026 Year 4	2027 Year 5	2028 Year 6
MINING									
Underground									
Operating Days	350	days	2,100	350	350	350	350	350	350
Tonnes milled per day		tonnes / day	1,177	495	1,231	1,711	1,717	1,683	227
Production		'000 tonnes	2,472	173	431	599	601	589	79
Production - MTL		'000 tonnes	1,685	173	394	401	398	268	51
Production - Faina		'000 tonnes	787	-	37	198	203	320	28
Au		g/t	4.08	3.26	3.56	3.88	4.00	4.92	4.52
Au MTL		g/t	3.55	3.26	3.43	3.42	3.44	4.28	3.46
Au Faina		g/t	4.78	-	4.96	4.82	5.11	5.45	6.46
Waste		'000 tonnes	1,350	88	334	301	349	276	2
Waste MTL		'000 tonnes	808	68	202	183	156	196	2
Waste Faina		'000 tonnes	542	20	132	118	193	80	-
Total Moved		'000 tonnes	3,823	261	765	900	950	865	82
PROCESSING									
Mill Feed		'000 tonnes	2,472	173	431	599	601	589	79
Au grade		g/t	4.08	3.26	3.56	3.88	4.00	4.92	4.52
Contained Au		oz	324,190	18,170	49,277	74,740	77,360	93,098	11,546
Mill Feed MTL		'000 tonnes	1,685	173	394	401	398	268	51
Au grade		g/t	3.62	3.26	3.43	3.42	3.44	4.28	3.46
		oz	192,255	18,170	43,341	44,038	44,051	36,963	5,692
Mill Feed MTL		'000 tonnes	787	-	37	198	203	320	28
Au grade		g/t	4.78	-	4.96	4.82	5.11	5.45	6.46
		oz	131,935	-	5,935	30,702	33,309	56,134	5,854
Recovery Method #1									
Au	87%	%	87%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%
Recovery Method #2									
Au	55%	%	55%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Ag		%	0%	0%	0%	0%	0%	0%	0%
Net Recovery									
Au		%	75%	87.0%	83.1%	73.9%	73.2%	67.7%	70.8%
Recovery Method #1									
Au	87%	oz	167,262	15,808	37,707	38,313	38,324	32,158	4,952
Recovery Method #2									
Au	55%	oz	72,564	-	3,264	16,886	18,320	30,874	3,220
Total Recovered									
Au		**oz**	**239,826**	**15,808**	**40,971**	**55,199**	**56,644**	**63,032**	**8,172**
REVENUE									
Metal Prices		**Input Units**							
Au	US$1650 /oz Au	US$/oz Au	$ 1,650.00	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650
Exchange Rate	1.00 US$ = 1.00 C$	US$ 1.00 = X C$	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Au Payable Percentage	100%	US$ '000	100%	100%	100%	100%	100%	100%	100%
Au Gross Revenue		US$ '000	$ 395,515	$ 26,070	$ 67,569	$ 91,033	$ 93,416	$ 103,951	$ 13,477
Total Gross Revenue		US$ '000	**$ 395,515**	**$ 26,070**	**$ 67,569**	**$ 91,033**	**$ 93,416**	**$ 103,951**	**$ 13,477**
Transport									
Au	US$.00 /oz Au	US$ '000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Treatment									
Au	US$.00 /oz Au	US$ '000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Refining cost									
Au	US$0.00 /oz Au	US$ '000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Charges		US$ '000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Smelter Return		US$ '000	$ 395,515	$ 26,070	$ 67,569	$ 91,033	$ 93,416	$ 103,951	$ 13,477
Royalty NSR	8.00%	US$ '000	$ 31,641	$ 2,086	$ 5,406	$ 7,283	$ 7,473	$ 8,316	$ 1,078
Net Revenue		**US$ '000**	**$ 363,874**	**$ 23,984**	**$ 62,163**	**$ 83,750**	**$ 85,943**	**$ 95,635**	**$ 12,399**
Unit NSR		**US$/t milled**	**$ 147.19**	**$ 138.42**	**$ 144.32**	**$ 139.82**	**$ 143.04**	**$ 162.38**	**$ 156.18**
CUT-OFF GRADE									
Net Revenue by Metal									
Au		%	100%	100%	100%	100%	100%	100%	100%
Revenue per Metal Unit (NSR Factor)									
Au		US$ per g Au	$ 36.09	$ 42.44	$ 40.56	$ 36.03	$ 35.72	$ 33.03	$ 34.53
OPERATING COST									
Mining (Underground) Pre Tax	$ 42.26	US$/t milled	$ 42.26	$ 42.26	$ 42.26	$ 42.26	$ 42.26	$ 42.26	$ 42.26
Mining (Underground) Post Tax	$ 47.94	US$/t milled	$ 47.94	$ 47.94	$ 47.94	$ 47.94	$ 47.94	$ 47.94	$ 47.94
Processing MTL	$ 29.44	US$/t milled	$ 29.44	$ 29.44	$ 29.44	$ 29.44	$ 29.44	$ 29.44	$ 29.44
Processing Faina	$ 37.09	US$/t milled	$ 37.09	$ 37.09	$ 37.09	$ 37.09	$ 37.09	$ 37.09	$ 37.09
G&A	$ 7.07	US$/t milled	$ 7.07	$ 7.07	$ 7.07	$ 7.07	$ 7.07	$ 7.07	$ 7.07
Total Unit Operating Cost		**US$/t milled**	**$ 78.77**	**$ 78.77**	**$ 78.77**	**$ 78.77**	**$ 78.77**	**$ 78.77**	**$ 78.77**
Mining (Underground)		US$ '000	$ 104,474	$ 7,323	$ 18,203	$ 25,314	$ 25,391	$ 24,889	$ 3,355
Processing MTL		US$ '000	$ 49,620	$ 5,101	$ 11,586	$ 11,805	$ 11,717	$ 7,904	$ 1,507
Processing Faina		US$ '000	$ 29,179	$ -	$ 1,380	$ 7,344	$ 7,523	$ 11,887	$ 1,046
G&A		US$ '000	$ 17,478	$ 1,225	$ 3,045	$ 4,235	$ 4,248	$ 4,164	$ 561
Total Operating Cost		**US$ '000**	**$ 200,752**	**$ 13,649**	**$ 34,214**	**$ 48,698**	**$ 48,879**	**$ 48,844**	**$ 6,469**
			837.07						
Operating Cashflow		US$ '000	$ 163,122	$ 10,336	$ 27,950	$ 35,052	$ 37,064	$ 46,791	$ 5,930

	INPUTS	UNITS	TOTAL	2023 Year 1	2024 Year 2	2025 Year 3	2026 Year 4	2027 Year 5	2028 Year 6
CAPITAL COST									
Direct Cost									
FAINA_Equipment + Engineering		US$ '000	$ 5,238	$ -	$ -	$ 5,238	$ -	$ -	$ -
FAINA_CAPEX Non Sustaining		US$ '000	$ 2,744	$ -	$ 1,336	$ 1,408	$ -	$ -	$ -
FAINA_Exploration		US$ '000	$ 1,700	$ 200	$ 500	$ 500	$ 500	$ -	$ -
FAINA_CAPEX Non Sustaining		US$ '000	$ 9,839	$ -	$ 1,465	$ 8,374	$ -	$ -	$ -
MTL_CAPEX Non Sustaining		US$ '000	$ 1,824	$ -	$ 602	$ 519	$ 387	$ 316	$ -
MTL_CAPEX Non Sustaining			$ 7,692	$ -	$ 962	$ 2,885	$ 962	$ 2,885	$ -
MTL_Exploration		US$ '000	$ 1,700	$ 200	$ 500	$ 500	$ 500	$ -	$ -
Total Direct Cost		**US$ '000**	**$ 30,737**	**$ 400**	**$ 5,365**	**$ 19,423**	**$ 2,349**	**$ 3,201**	**$ -**
Other Costs									
EPCM / Owners / Indirect Cost	0%	US$ '000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subtotal Costs		**US$ '000**	**$ 30,737**	**$ 400**	**$ 5,365**	**$ 19,423**	**$ 2,349**	**$ 3,201**	**$ -**
Contingency	15%	US$ '000	$ 4,611	$ 60	$ 805	$ 2,913	$ 352	$ 480	$ -
Initial Capital Cost		**US$ '000**	**$ 35,348**	**$ 460**	**$ 6,169**	**$ 22,336**	**$ 2,701**	**$ 3,681**	**$ -**
Sustaining		US$ '000	$ 5,224	$ 400	$ 1,602	$ 1,519	$ 1,387	$ 316	
Reclamation and closure		US$ '000	$ 6,704	$ 1,000	$ 3,008	$ 982	$ 381	$ 381	$ 952
Total Capital Cost		**US$ '000**	**$ 47,276**	**$ 1,860**	**$ 10,779**	**$ 24,837**	**$ 4,469**	**$ 4,378**	**$ 952**
			197.12						
CASH FLOW									
Net Pre-Tax Cashflow		**US$ '000**	**$ 115,846**	**$ 8,476**	**$ 17,171**	**$ 10,215**	**$ 32,595**	**$ 42,413**	**$ 4,977**
Cumulative Pre-Tax Cashflow		US$ '000		$ 8,476	$ 25,646	$ 35,861	$ 68,456	$ 110,869	$ 115,846
Taxes (from Proforma)	12%	US$ '000	$ 13,902	$ 1,017	$ 2,060	$ 1,226	$ 3,911	$ 5,090	$ 597
After-Tax Cashflow		**US$ '000**	**$ 101,945**	**$ 7,458**	**$ 15,110**	**$ 8,989**	**$ 28,683**	**$ 37,323**	**$ 4,380**
Cumulative After-Tax Cashflow		US$ '000		$ 7,458	$ 22,569	$ 31,558	$ 60,241	$ 97,564	$ 101,945
All-In Sustaining Cost		**US$/oz**	**$ 3,400**	$ 400	$ 1,000	$ 1,000	$ 1,000	$ -	$ -
All-In Cost		**US$/oz**	**$ 3,547**						
PROJECT ECONOMICS									
Pre-tax NPV at 7.5% discounting	7.50%	US$ '000	$88,140						
Pre-tax NPV at 10% discounting	**10.0%**	**US$ '000**	**$80,978**						
Pre-tax NPV at 15% discounting	15.0%	US$ '000	$68,945						
After-Tax NPV at 7.5% discounting	7.50%	US$ '000	$77,564						
After-Tax NPV at 10% discounting	**10.0%**	**US$ '000**	**$71,260**						
After-tax NPV at 15% discounting	15.0%	US$ '000	$60,671						

Making Sustainability Happen